

# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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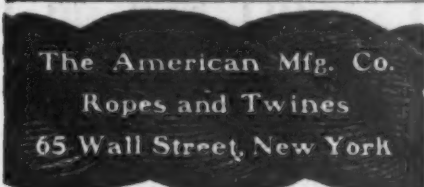
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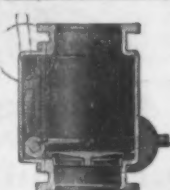
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# THE IRON AGE

New York, Thursday, February 7, 1907.

## The American Cast Iron Pipe Company's Foundry.

The plant of the American Cast Iron Pipe Company, located on the northern outskirts of Birmingham, Ala., is one of the latest additions to the number of well designed pipe foundries that have been a feature of the new erection in the South. Proximity to blast furnaces was a prime consideration in the selection of a site, as was the more reasonable basis of land values at a little distance from the city. The development of the plans

construction were in charge of Chas. W. Hill, engineer and contractor, Birmingham, Ala. The steel frame of the main building together with the steel roofing was completed within 14 weeks of the signing of the contract. The site is underlaid with clay and the foundation work presented a minimum of difficulty. The main foundry building, which is 97 ft. 6 in. x 349 ft. 6 in. outside, has steel trusses and purlins and is covered by No. 20 gal-

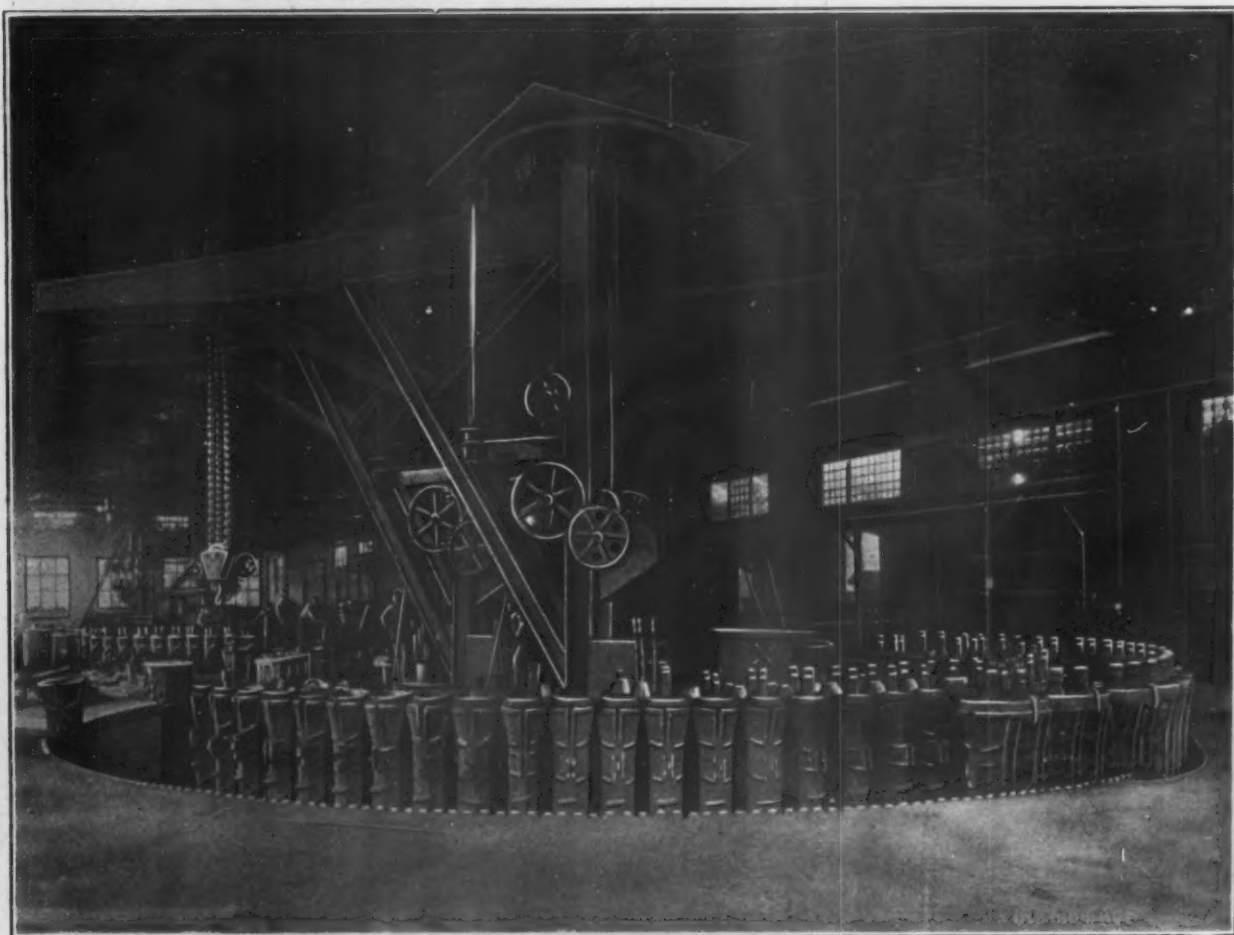


Fig. 1.—View of Nos. 1 and 2 Casting Pits, American Cast Iron Pipe Company's Foundry, Birmingham, Ala.

was in the hands of E. E. Linthicum, general manager of the company, whose experience in pipe manufacture had suggested features of construction and arrangement calculated to yield everyday returns in economy of handling raw materials and finished product. Pipe founding is conspicuously a business in which large tonnages are essential to success and in which therefore any shortcoming in mixture or in the molding, melting or casting of a single day's product is costly in contributions to the scrap heap. The prevalent notion that the manufacture of cast iron pipe is so largely a mass and routine operation that success is easy has had some rude shocks in actual practice.

The American Cast Iron Pipe Company secured a site of 52 acres, to which the haul for the bulk of the pig iron it uses is but two miles or less, there being direct connection with the Louisville & Nashville, the Southern Railway, Alabama Great Southern and the Birmingham Belt Line. The designing of the plant was started October 1, 1905, ground was broken on October 23, 1905, and the first cast was made on May 14, 1906. Designing and

vanized corrugated roofing rolled from muck bar iron. Extending the entire length of the roof is a monitor with 6-ft. openings on the sides which are filled with galvanized louvers. The monitor itself is ventilated still further by pipe ventilators. Considerable light is also admitted through the louvers. In the main the foundry is lighted by large windows in the sides and ends of the buildings, these being made up of a series of sash. The latter turn on a vertical axis, and in the hot weather the entire window area can be thrown open. The provision for ventilation thus seems to be ample, a consideration of no small importance in the South during the hot months.

The steel roof trusses, which are 20 ft. 9 in. between centers, span the entire width of the building and rest upon columns 28 ft. high. These columns have two members. The first, a vertical member made up of four angles and plate construction, carries the vertical strain coming on the columns from the trusses. The second member is a steel brace made of two angles which are laced to the vertical member of the columns by smaller

angles. The base of the brace member is 5 ft. from the base of the vertical member. A 13-in. curtain wall of brick is built between the angles of the vertical member of the columns, and thus the steel brace is entirely on the outside of the building. The vertical and brace members of the columns have bottom bearing plates which are fastened to the foundation with anchor bolts. The foundations under the columns and below the floor level extend into the building about 6 ft. Thus, whether the strain coming on the brace member of the columns; due to the stress imposed by jib cranes, is tension or compression, the weight of the brick curtain wall acts with a lever arm of about 4 to 8 ft. as a resisting moment. The jib cranes at the pipe pits, as shown in Fig. 1, have their bottom bearings securely anchored to the foundations of the pipe pit, and their top bearings are anchored

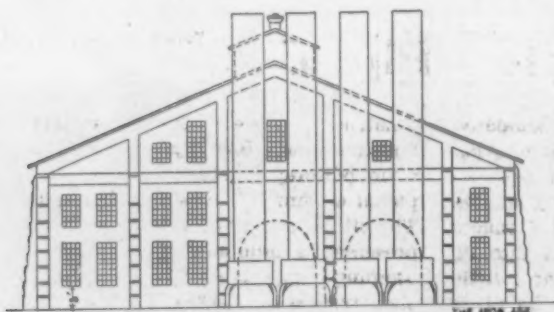


Fig. 2.—Elevation of East or Cupola End of Main Building.

to the roof trusses in the plane of the bottom chord of the trusses. The horizontal stresses of each jib crane are distributed to the tops of five columns on each side of the building.

Figs. 2 and 3 are an end and side elevation of the main foundry building. The two cupolas now in use have been built at the end and outside of the foundry, as shown in Fig. 2. In the yard adjoining, the pig iron and scrap are stored, while on a platform at the side

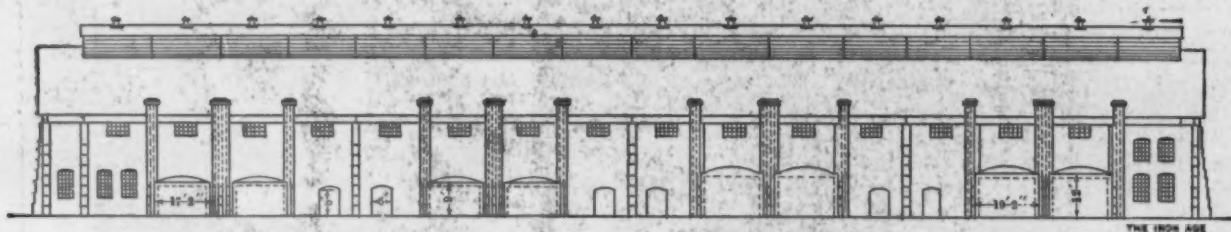


Fig. 3.—Elevation of North or Core Oven Side of Main Building.

of the iron storage yard a large stock of coke can be carried. An extension of this platform affords a runway for two-wheel steel barrows used in charging coke into the cupolas. Recently the storage yard has been roofed over, giving protection to workmen against inclement weather as well as against the sun in the hot season. Later two 5-ton cranes will be provided for the stock yard and magnets will be used for picking up pig iron and delivering it to the cupola charging platform. The crane runway will have the same direction as the length of the foundry and will command railroad tracks, so that iron can be taken direct from cars. Sand bins, each having capacity of five carloads, are located on a side track running the entire length of the plant on the north side of the main foundry building. The company has its own track system—a total length of  $1\frac{1}{2}$  miles—so arranged that materials are carried to the point of use with the least handling. Of two tracks into the plant one is on the north side and the other on the south side. All material coming in is handled on the north side track and is then worked through the shop, coming out on the south or cleaning-shed side of the building and going through the various finishing processes on its way to the shipping tracks.

The core department is on the north side of the building, adjoining the sand bins, a section about 25 ft. in width on that side being devoted to core floors alternat-

ing with the core ovens. There are eight ovens, two to each casting pit, all extending their entire length beyond the wall of the building, the firing pit being on the outside at the end of the ovens. The core oven roofs are of concrete supported on steel beams. This construction was adopted as it gave a roof low enough to allow space for windows in the foundry wall above the ovens, affording additional light and ventilation. The winding of hay rope on steel pipe is accomplished rapidly, power being furnished from a line shaft and a system of cone pulleys. Each core machine is served by a mud mill. The finished cores are handled by an overhead trolley system operated by friction drive from the main line shaft, being placed on racks which are mounted on wheels, so that the rack with its load of cores may be readily pushed into the oven. The core ovens have each a capacity of 800 in. of pipe reckoned in diameters.

The two Whiting cupolas are 78 in. in diameter, having a capacity of 18 to 20 tons an hour. Blast is provided by a Root positive pressure blower, driven from the main line shaft. The blower room, 14 x 22 ft., is an extension of the main building. A hydraulic elevator is used to elevate the various materials to the cupola charging floor. Iron is conveyed from the cupolas to the foundry floor in ladle cars by mules over a tram track running the full length of the foundry. Molding and casting operations are carried on at present in three circular pits, though floor room is provided for four and the fourth will soon be built. These pits have heavy concrete retaining walls and bottoms and the mold drying ovens underneath are of unusual size, giving each pit an output of 1200 in. of pipe. Two 10-ton electric jib cranes furnished by the Cleveland Crane & Car Company, Cleveland, serve each pit in the placing of flasks and cores, the pouring of iron and the shaking out of pipe. The cranes are of unusually heavy construction and a special design was adopted, giving 20 to 25 per cent. greater speed than is possible with the ordinary shop crane.

The method of molding and casting is the same as that employed at the majority of pipe shops. Sand is

wheeled in barrows from bins to pits. All ramming is done by hand. Molds and cores are dried over night. Pouring begins early in the morning and continues through the day. After the pipes are cast and shaken out the molds and cores are put up for the following day. Opposite each pit in the south wall of the foundry is a wide doorway, commanded by the jib cranes. Through these openings the pipe as they are shaken out are deposited on inclined skidways which run the length of the chipping and cleaning sheds, the latter being at right angles to the main building. The center shed, as shown at the left in Fig. 4, to which pipe from the parallel cleaning sheds on either side are rolled on trackways, is 300 ft. long and 35 ft. wide. The three sheds give room for holding an entire day's product. About midway of the length of the middle or No. 2 shed are located heating ovens and the dip tank. The pipe are pushed from the chipping and cleaning skidways into ovens, fired by coke, and in which a temperature of 300 degrees F. is maintained. Emerging from the chamber each pipe is picked up by a hydraulic crane and dipped in a tar vat. The tar is kept at a temperature of 300 degrees, and the immersion lasts for five minutes. Thence the pipes are rolled to the testing press, where they are subjected to a water pressure of 300 lb. per square inch. Passing afterward over the scales and to inspection floors they are rolled to the storage yard alongside loading tracks, the



slope of the ground being such that only hand labor is required for loading into cars. All the product of the company is made in conformity with the standard specifications for cast iron pipe and fittings adopted by the New England Water Works Association.

The machine shop is 70 ft. x 106 ft., and is a wood frame structure with corrugated iron roof. It has a 30-ft. span crane in its center bay, and the heavy machines are so placed in it that work can be handled by

way through the machine shop and foundry. This runway will be extended toward the main foundry so that cranes can pass over the area of the casting cleaning floor.

The pattern shop, 91 ft. x 40 ft., adjoins the machine shop. It is equipped with an Oliver wood trimmer and with the following Fox Machine Company tools: Two lathes, a planer, band saw and cut-off saw. For the present a portion of the pattern shop building is devoted

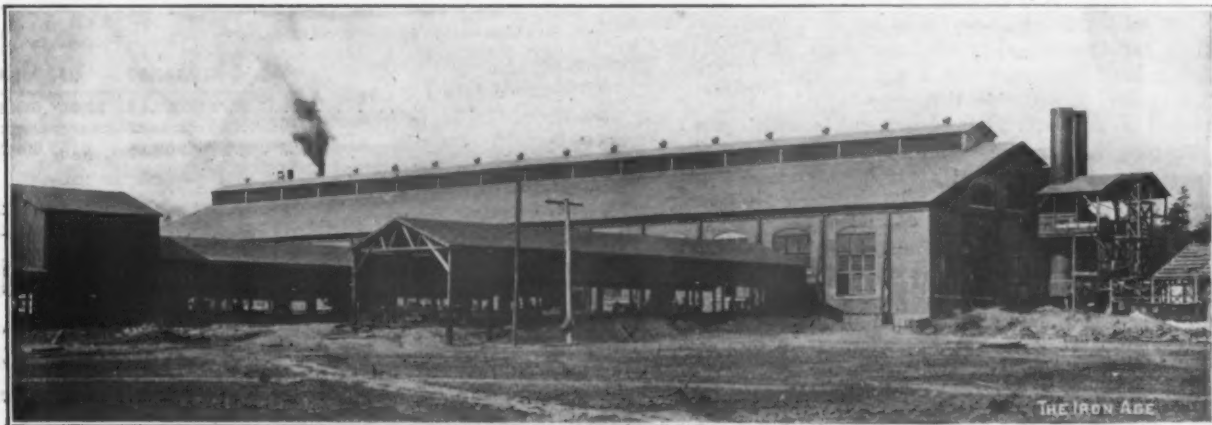


Fig. 4.—Exterior View, Showing Outside Location of Cupolas, Also Stock Yard Shed Under Construction.—Dipping Shed at Left, in the Line of Cleaning Shed No. 2.

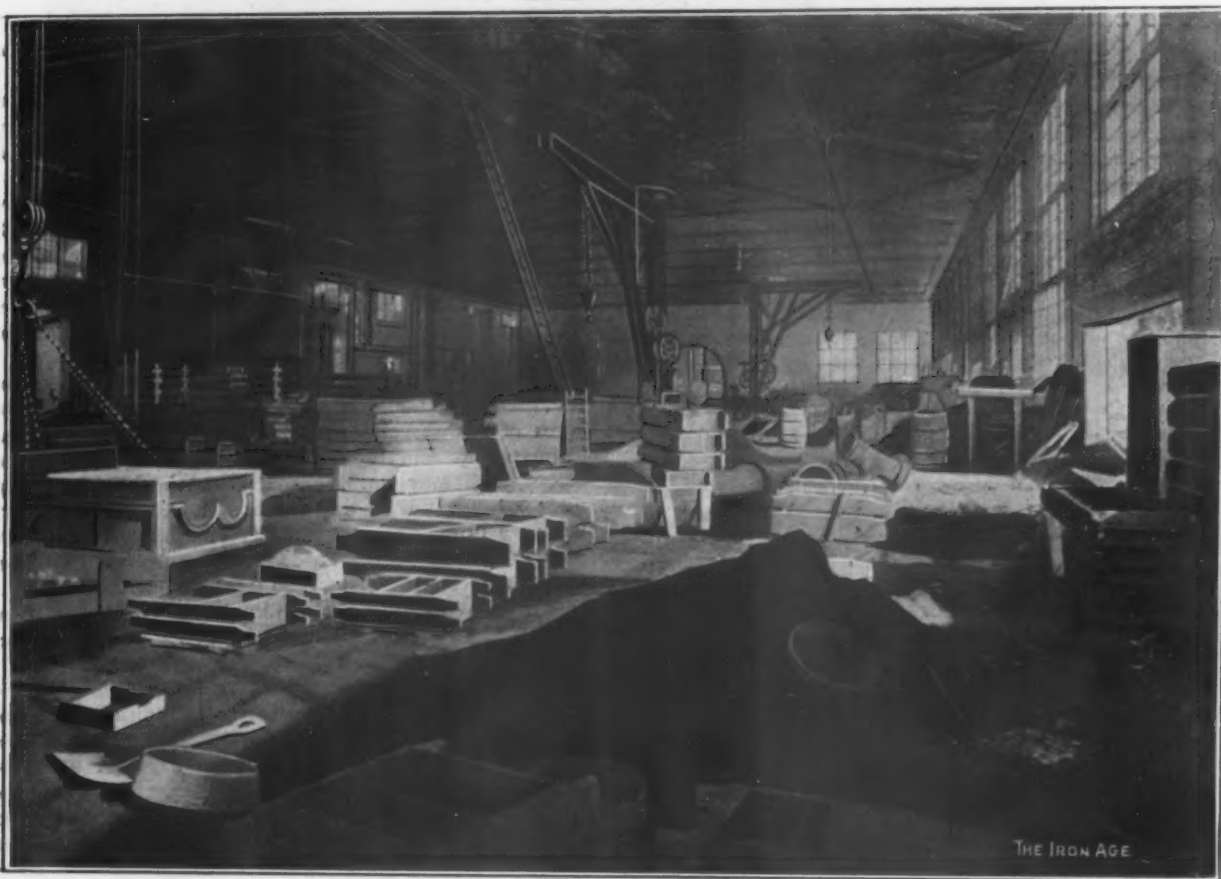


Fig. 5.—Floor for Special Castings.—Core Ovens on the Left.

crane onto the machines. The tools consist of three lathes, radial drill, straight drills, planer, shaper, &c., all driven from line shafting.

At present the molding floor for special castings, of which a view is given in Fig. 5, occupies a portion of the main foundry building, but plans are being prepared for a separate building for special castings, of similar design to the machine shop. This foundry will be placed in line with the machine shop, and will be built on the end of the latter farthest from the main foundry building. Between the special foundry and machine shop will be a space for cleaning castings. The foundry will be served by electric cranes traversing a continuous run-

to hay rope twisting, three machines being installed. A storage building is provided, alongside the incoming railroad track, in which miscellaneous supplies are kept. Space is also given in the same building to pattern storage.

The power house is 100 ft. 8 in. x 40 ft. 8 in. Three 100-hp. tubular boilers were furnished by the Atlas Engine Works, Indianapolis, Ind. The engine is of the Corliss type, 200 hp., and was built by the Hardie-Tynes Mfg. Company, Birmingham, Ala. It drives the various machines through line shafting. Electrical power is distributed from a 125-kw. Westinghouse generator direct connected to a Buckeye high-speed engine.

The water supply is secured from the North Birmingham City water works, but the company also has a large spring close to the foundry. A pipe connects the spring with a large pump in the power house, so that in case of a break in the city connection or other interruption, the plant can be supplied by pumping from the spring. Ultimately all water will be pumped from this source. Waste water from the hydraulic cupola-lift and from the testing press goes into a catch basin and is repumped. A tank of 10,000 gallons capacity serves the testing plant.

A laboratory will probably be built later, but meantime facilities are provided for such physical tests as are made. Test bars are 1 x 2 in. and 26 in. long and are broken in a Riehle Bros. special machine. They are placed on supports 24 in. apart and loaded in the center. For pipe 12 in. or less in diameter the pieces are expected to sustain a load of 1000 lb. and to show a deflection of not less than .30 in. before breaking. For pipe larger than 12 in. the required load is 2000 lb. and the deflection not less than .32 in. At present the product consists of pipe 4 to 16 in. in diameter. A fourth pit will be provided in which will be made pipe up to 36 in. in diameter. The output is now about 100 tons a day and from 350 to 400 men are employed.

The officers of the American Cast Iron Pipe Company are the following: J. J. Egan, president; E. L. Douglass and W. W. Orr, vice-presidents; C. Blair, secretary; J. W. Blair, treasurer; E. E. Linthicum, general manager; P. A. Ivy, sales agent.

### The Lackawanna Steel Company's Report.

President E. A. S. Clarke has submitted to the stockholders of the Lackawanna Steel Company the following statement of the operations of the company for the year ending December 31, 1906:

"During the year your plant at Buffalo, as originally planned, has been completed, together with certain additions to open hearth steel making capacity found necessary to a proper working balance. The period of organization and training incident to all new works has prevented a full output and normal earnings, but notwithstanding the fact that considerable construction work has been carried on during the year most of the errors and weaknesses of plant and organization have been corrected, and it is only since October 1 last that it may fairly be said that your works have been in full operation.

"Your company received during 1906 from mines which it owns, or in which it is interested, 1,893,662 gross tons of ore, and produced 927,176 gross tons of pig iron and spiegelisen. It also produced 848,300 tons of Bessemer and 352,791 tons of open hearth ingots, a total of 1,201,091 tons of steel ingots. Shipments of product in the fourth quarter of 1906 and in the entire year were as follows:

	Fourth quarter.	Year 1906.
	Gross tons.	Gross tons.
Standard rails.....	154,384	556,755
Light rails.....	14,538	47,868
Angle bars, fittings, &c.....	11,081	43,639
Structural shapes.....	41,164	121,407
Plates.....	21,556	95,244
Merchant steel products.....	16,108	52,401
Slabs, billets and blooms.....	6,122	17,078
Pig iron and miscellaneous.....	1,525	34,655
Totals.....	266,478	969,047

"In anticipation of earlier operations contracts for the sale of a considerable tonnage of steel were made during the period of low prices obtaining in 1904. Owing to delay in completing your plant a substantial part of the above material has had to be shipped during the past year, which has prevented your realizing to a full extent the benefits of the active demand and favorable prices for steel prevailing during 1906. I am pleased to state, however, that there seems to be every indication of a continuance of prosperous times for the steel business during 1907. Orders on our books at the close of 1906 amounted to 707,494 tons, an increase of 55 per cent. over the corresponding date in 1905.

"The following statement of earnings (which is sub-

ject to the annual audit now in progress) shows that during the last quarter of 1906 your property has been earning at the rate of 14.98 per cent. per year on your stock. The year 1907 should show an increase over this:

	Year 1906.	Fourth quarter 1906.
Gross sales and earnings.....	\$29,002,169.46	\$8,674,967.61
Manufacturing cost and operating expenses.....	23,862,622.50	6,866,327.86
Gross profit.....	\$5,139,546.96	\$1,808,639.75
Income from real estate, interest on bills and loans receivable, and investments in other companies.....	870,110.20	289,988.40
Gross income.....	\$6,009,657.16	\$2,098,628.15
Deduct: General expenses.....	\$583,456.18	\$152,000.01
Interest on bonds of subsidiary companies and on bills and loans payable.....	231,842.89	76,833.28
Rentals and royalties.....	154,929.42	40,495.26
Reserves for depreciation and extinguishment, extraordinary replacements, contingencies, &c.....	*430,463.82	†206,441.46
Interest on bonds and notes of Lackawanna Steel Company.....	1,250,000.00	312,500.00
Total deductions.....	\$2,650,692.31	\$787,779.01
Surplus net income.....	\$3,358,964.85	\$1,310,849.14
Appropriated for additions and improvements to property and construction and for discharge of capital liability.....	515,506.76	175,110.02
Balance of surplus.....	\$2,843,458.09	\$1,135,739.12

\* In addition to expenditures for ordinary repairs and maintenance, approximating \$1,889,720.01.

† In addition to expenditures for ordinary repairs and maintenance, approximating \$521,562.90.

"There has been expended during the past two years in new construction and additions to property, chargeable to capital, \$8,210,865.51, of which \$2,754,487.99 was expended during 1906.

"Your directors have during the past year authorized the construction of an additional blast furnace at Buffalo of a daily capacity of 500 tons, and the building of the same has progressed so far that it is expected to have it in operation by March 1 next. Another similar furnace should be built during 1907 to give the best results for your property.

"Your directors have also negotiated the purchase of the Ellsworth Coal Company, which owns some 15,000 acres of coking coal lands in Washington County, Pa., estimated to contain over 110,000,000 tons of coal, together with four working shafts and a splendid equipment of machinery, miners' houses, &c., the property having a present annual capacity of upward of 2,000,000 tons of coal a year. Through this purchase they feel that your company has been provided with an ample supply of coking and gas coal, which, by rendering it independent of the fluctuations of the coal and coke market, should considerably increase its earnings.

"Although all the surplus of 1906 has been used for working capital or new construction, additions and improvements, your directors are satisfied that further new construction and additions are necessary and desirable for the proper development of your plants, as well as for reduction in operating costs, and that more ample working capital should be provided, and they are considering ways and means of providing proper funds for these purposes. Under these circumstances it has not been deemed wise to declare any dividend on your stock."

The Crocker-Wheeler Company held its annual meeting of officers and branch managers at the main office and works, Ampere, N. J., January 23 to 26, at which time it was announced that the company had done more business during 1906 than in any other year since it was formed 18 years ago. The special products mostly responsible for this were alternating current generators of large capacity, direct current motors for machine tools and general machinery, the type W rolling mill motors, and transformers and induction motors. The personnel of the company remains substantially the same as at the previous annual meeting.



### The Coulter Horizontal Nut Tapper.

A number of features favorable to very rapid production and simple operation are to be found in the Coulter horizontal geared nut tapping machine, built by the Automatic Machine Company, Bridgeport, Conn. Fig. 1 gives a general view of the working side of the machine.

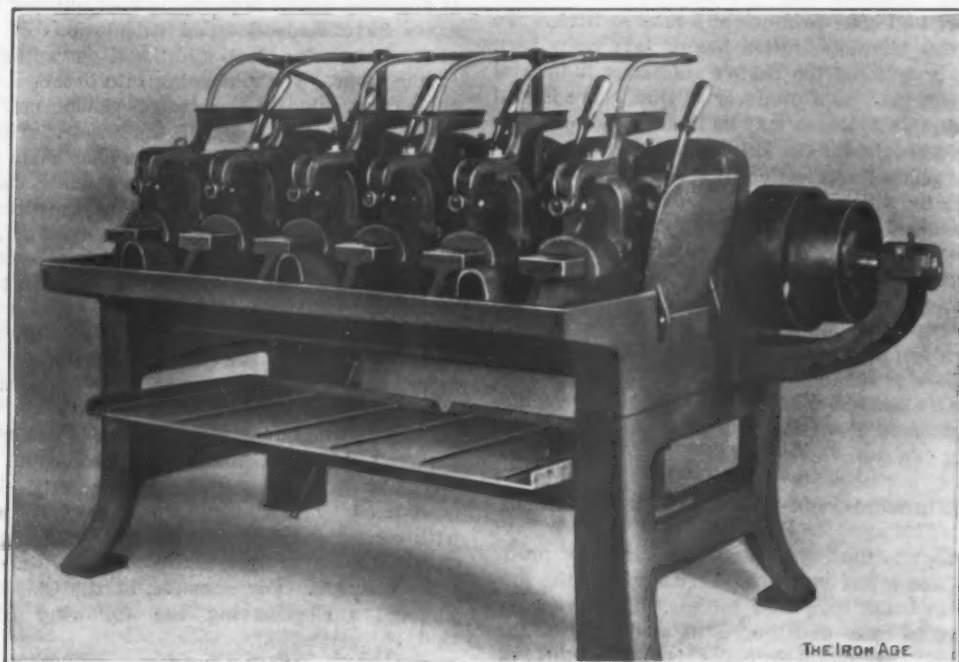


Fig. 1.—The Coulter Horizontal Nut Tapper, Built by the Automatic Machine Company, Bridgeport, Conn.

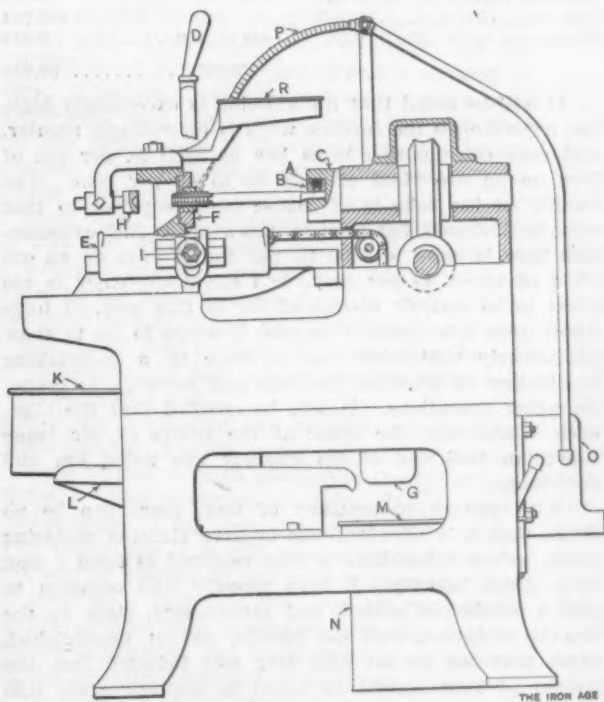


Fig. 2.—End Elevation of the Coulter Nut Tapper, Showing a Section through One of the Spindles.

and Fig. 2 an end elevation, partly a section through one of the tapping units.

As will be seen in Fig. 2, the tap is held by the friction A in a collet, B, secured in the spindle C, which is driven by worm and gear. The handle D draws back the slide E to permit inserting a nut in the nut holder F. The slide with the nut holder is made to follow the nut during the operation of tapping by the weight G, which is attached to the slide by a chain passing over a roller in the head of the machine. An adjustable stop, not shown, is provided to prevent unnecessary travel of the slide E, after the nut has passed over the threaded portion of the tap. There

is also an adjustable stop, H, back of the nut holder to prevent the tap from working out of the collet between the tapping of one nut and the inserting of another.

When the shank of the tap can hold no more tapped nuts the slide E is pulled back by the handle D, the tap is drawn from the collet, and the nuts are allowed to slide off the shank through an opening in the bed into

tote boxes, K. The tap is replaced in the collet without stopping the machine. The use of taps of different lengths is provided for by making handle D and slide E adjustable in their relation to one other through the bolt I. The tote boxes, having perforated bottoms, allow the oil to be drained from the finished nuts to the table L and thence into the settling pan M, which overflows into the tank N. From the latter oil is drawn by the circulating pump O, and delivered through flexible tubes, P, and elongated funnels, R, to the cutting parts of the taps, insuring the lubrication of each tap at every position of its slide. Provision is made for removing the chips from the bed of the machine.

It is stated that in commercial use the machine is producing from 9000 to 10,000  $\frac{1}{2}$ -in. malleable iron nuts in 10 hr. with four spindles, and the same number of  $\frac{3}{4}$ -in. nuts with six spindles. The machine is without lifting weights or treadles, and may be operated by a boy. The parts are simple and readily removed for cleaning, oiling, &c., and quickly adjustable for changes in work. The nut holders are in one piece, and can be adjusted to suit taps of any length from 8 to 16 in.

The Ocmulgee, the fourth steel freight steamer for the Atlantic & Birmingham Construction Company, was launched January 29 at the works of the Fore River Shipbuilding Company, Quincy, Mass. These vessels are for service between New York and Brunswick. They have a length over all of 312 ft. 10 in., beam molded 40 ft., depth 27 ft. 9 in., and draft loaded 18 ft. They are fitted with triple expansion engines and two single end Scotch boilers.

It is said that a scheme is in progress for supplying the ancient Spanish town of Seville with electric power from El Carchado, 80 miles away. Three 1500-hp. turbines at 400 rev. per min. are to drive generators operating at 5000 volts. Transmission is to be at 50,000 volts, after which the current will be stepped down to 3500. The plant will be on the three-phase system at 40 cycles.

## Alabama Iron Manufacture.

### Possible Economies in the Blast Furnace.

BY JOHN J. PORTER, STAUNTON, VA.

Some years ago it was said in connection with its iron resources that Alabama was pre-eminently that State "where nature had done so much and man so little." To some extent this characterization has of late years been modified, but in spite of the State's enormous industrial growth and high rank as a producer of iron, there is still something lacking. Alabama may be likened to the spendthrift with no thought for the future, and there is noticeably absent a general application of scientific methods in manufacturing by which the resources of nature are husbanded and utilized with an eye to the greatest ultimate profit. The cause of the general carelessness in this respect is found in that very lavishness of nature, whose bounty so freely distributed removes our incentive to economy and ingenuity.

"When we can manufacture for \$10 the iron which we sell at \$15, why strain every nerve to lower this cost another dollar? Reduction of costs means improvements, experimenting, expert advice, and these in turn mean capital outlay. We are earning good dividends. Why should we risk a change?" So run the arguments, in thought if not in words, and the result is wasteful management.

How different is the case where the margin of profit is very small and a few cents per ton makes all the difference between bankruptcy and success. Here we have every incentive to care, and the result again proves the truth of the old saying, "Necessity is the mother of invention."

#### The Cost of Manufacturing Iron

In Alabama has been frequently discussed in the technical papers, and is therefore a familiar subject to most readers. However, in order to refresh the memory, I give in the accompanying table a few condensed cost sheets, taken at random from my notes, and representing work done during the past five years. I will have occasion to refer to them from time to time during the following discussion.

Some Costs of Pig Iron at Alabama Furnaces.

	A.	B.	C.	D.	E.
	—Tons* used per ton* of iron.				
Ore .....	2.27	2.31	2.14	2.45	2.48
Coke .....	1.72	1.47	1.58	1.57	1.56
Limestone .....	0.83	0.62	0.52	0.36	0.54
	Cost per ton of iron.				
Ore .....	\$2.09	\$2.06	\$2.14	\$2.68	\$2.61
Coke .....	5.15	4.46	4.52	4.88	6.24
Limestone .....	.52	.37	.28	.15	.40
Labor .....	1.21	1.11	1.05	.79	.50
Supplies, repairs, &c. ....	1.25	1.27	1.24	1.00	.87
Total cost....	\$10.22	\$9.27	\$9.23	\$9.50	\$11.02
	Per cent. of total cost.				
Ore .....	20.5	22.2	23.1	28.2	23.7
Coke .....	50.4	48.1	49.0	51.4	56.6
Limestone .....	5.1	4.0	3.0	1.6	3.6
Labor .....	11.7	12.0	11.4	8.3	8.2
Supplies, &c. ....	12.3	13.7	13.5	10.5	7.9

\* Tons of 2240 lb.

Let us now take up the economies, possible and prospective, in some of the items of the cost sheets.

With regard to the ores, there seems to be but little of interest in this connection, for although there are important economies to be obtained through concentration of the ores their effects will be apparent through the decrease in flux and fuel. Available ore lands are even now a scarce article in Alabama, being steadily absorbed into the reserves of the larger companies. Mining costs will no doubt show a steady increase over a series of decades, and the time cannot be long delayed before the leaner ores will be exploited and by concentration made available for commercial use.

#### The Limestone.

In the case of flux, as with other raw materials, the cost per ton of iron is dependent both on price and amount used. The price, equivalent in general to the cost of quarrying plus cost of transportation, is probably sus-

ceptible of only slight diminution, and may in fact show an increase as the more distant quarries are called into service. The amount used, however, is dependent on the gangue in the ore and the ash in the coke, and hence can be considerably lessened by concentration of the ore and more efficient washing of the coal previous to coking.

In addition, there are other minor economies. Purity of the stone does not always receive the attention that it deserves, and it is probable that but few furnace managers have made detailed calculations of the total increased cost due to an additional percentage of impurity in the stone. Without going into detail, I may say that the expense due to the decreased efficiency of the stone itself is hardly a half of the whole. The cost of the fuel necessary to melt the extra slag made is (with high priced coke) the largest factor; while the increase in labor and fixed charges caused by the decreased output is by no means negligible. Under average Alabama conditions, if a stone with 2 per cent. gangue (silica plus alumina) is worth 75 cents per ton, it can be shown that a stone with 4 per cent. of these impurities is worth only 62 cents per ton. While it is not possible in every case to improve greatly the quality of the stone, still in many cases much can be done by closer co-operation between laboratory and quarry.

The question of alumina in slag is one which has long bothered Alabama, and one which could probably be solved by painstaking and scientific study. High alumina is claimed by most furnacemen to cause a sticky slag, with consequent irregular working and higher fuel consumption. This does not coincide with experience in other districts. For example, at the Clarence Works in England a slag having the following composition is made:\*

	Per cent.		Per cent.
Lime (CaO).....	38.25	Potash (K <sub>2</sub> O).....	0.776
Magnesia (MgO).....	8.91	Soda (Na <sub>2</sub> O).....	0.488
Silica (SiO <sub>2</sub> ).....	28.30	Sulphur (S).....	1.63
Alumina (Al <sub>2</sub> O <sub>3</sub> ).....	24.75		
Iron oxide (FeO).....	0.295		100.754
Manganese oxide (MnO) 0.36		Less O = S.....	0.815
		Total.....	99.939

It will be noted that the alumina is exceedingly high, but nevertheless the furnace work is exceedingly regular, and coke consumption is as low as 2300 lb. per ton of iron on an ore yield of only 39 to 40 per cent. The quality of the coke is of course much superior to that used in Alabama, but even so, the average fuel consumption here is close to 3300 lb. per ton of iron on an ore yield of about 40 per cent., and the discrepancy is too great to be entirely accounted for in this way. I have dwelt upon this example because it seems to me to show particularly well what can be done by a painstaking application of scientific methods and research to manufacturing operations. It will be recalled that the Clarence Works was the scene of the labors of Sir Isaac Lowthian Bell and of his scarcely less noted son and successor.

With respect to economy of flux, there can be no doubt that it is advantageous to have alumina replacing silica, as much less lime is then required to form a slag of a given basicity. I have recently had occasion to plot a number of actual, and satisfactory, slags on the triaxial diagram, and the results, as yet unpublished, show that for an all lime slag and foundry iron the weight of lime should be equal to approximately 0.25 times the alumina plus 1.4 times the silica. Thus it seems that nearly six times as much lime is required for a given weight of silica as for alumina.

#### The Fuel.

As the fuel cost is about 50 per cent. of the total, it is apparent that here we have the greatest opportunities for saving. Let us first take up the question of price, or cost of manufacture.

Leaving out of consideration the cost of mining the coal, which I am not prepared to discuss, the most obvious improvement would seem to be the introduction of by-product ovens; and in this connection we must chalk up a mark to the credit of Alabama, since she

\* I am indebted to Charles Catlett of Staunton, Va., for this analysis and for the particulars concerning it.



already possesses one of the few by-product plants manufacturing furnace coke. That there is a large economy in the use of by-product ovens is sufficiently attested by the fact that several companies stand ready to undertake the coking of coal without charge other than the value of the by-products which they obtain. Figures given by J. D. Pennock in the *Journal of the American Chemical Society* for 1899 would seem to show that, at that time at least, the value of the by-products obtained (including tar, ammonia, cyanides, benzol and gas) was slightly greater than the value of the coke; besides which it is beyond question that the yield of coke is increased by some 15 per cent.

The humble beehive oven, however, is also subject to great improvement in the way of economy, and as illustrating this point, I am tempted to cite one quite striking case which came to my notice. During the depression of 1903-04 a prominent company operating in the South secured the services, in a consulting capacity, of a well known mining engineer. This gentleman, after a careful examination and study of the conditions, was able to suggest and carry out slight changes in the operation and management of the coke ovens which reduced the cost of the coke by an average of 35 cents per ton. This saving was accompanied by an increase in output and quality, and was accomplished practically without capital expenditure. The ovens had formerly been managed with an efficiency up to the average of the district and the economies were all small ones, apparent only to the trained technical mind, and were carried out by the aid of a carefully devised system of efficiency records. I believe that the management of this company has since given up these records and the subordinates have been allowed to drift back into the old wasteful, shiftless habits. Eternal vigilance is the price of efficiency, to paraphrase an old saying.

#### The Operation of the Blast Furnace.

In any discussion of the economy of fuel in the blast furnace the subject of dry blast must inevitably take a prominent part. Personally I have no doubt that this invention will be an important feature in the economy of the future. I believe, moreover, that its principle is of more importance than the process itself, and now that attention has been called to the necessity of intensity of combustion, other methods of increasing this will also be gradually developed.

The waste of fuel due to unnecessary gangue in the ore and flux has already been spoken of. Based on average Alabama practice, and on the figures of heat distribution in the blast furnace given by Bell, I have calculated that each pound of slag will require approximately 0.31 lb. of coke to melt it. From this the importance of keeping the slag volume down to reasonable figures can be readily seen.

A particularly noticeable and unfortunate condition of Alabama furnace practice is the very large amount of coke that is wasted through solution in the upper part of the furnace. This condition is attributable in great part to the softness of the local coke when coked by the methods in vogue, and it is still an open question as to whether it will be possible in any way to overcome this. Surely it must be a bold man who will at the present time venture to deny this possibility, for the field is comparatively unexplored and holds forth great inducements to the scientific-technical investigator.

Although this softness of the coke is, in general, a problem for the coke maker rather than the furnace manager, yet there is in one respect a possibility of mitigating the waste at many plants. There are probably few furnacemen who have not seen large lumps of only partially decomposed limestone removed from the tuyeres, and there must also be but few who are not aware of the power of carbon dioxide to dissolve carbon at high temperatures. There seem, however, to be a good many furnacemen who are unable to put two and two together, for at a large number of plants the limestone is still charged in great lumps. Even a novice can see that these large pieces will give off their carbon dioxide much more slowly than the crushed stone, and that this

carbon dioxide, being liberated far down in the furnace at a comparatively high temperature, will have its solvent action on the coke enormously increased, with correspondingly greater waste of fuel.

There are many other details which offer possibilities for saving fuel, but the preceding will be sufficient illustration for the purposes of this paper.

#### Management Might Be Improved.

Management in the South is also possibly susceptible of great improvement. It is far from my intention to assert that the furnace managers of Alabama are, as a class, any less competent than those elsewhere, but, whether owing to the greater difficulties encountered or to other causes, it is certainly true that irregularity of operation is a common fault of this district. The importance of this regularity is usually more strongly appreciated by the furnace superintendent than by those higher in authority, and I believe that one of the chief reasons why the steel works blast furnaces of the North have been able to make such wonderful records is because this principle has been so thoroughly grasped by those in authority.

The items of labor cost and fixed charges will offer opportunities for economy varying greatly at different plants. On the average, however, these chances will be especially great in Alabama, owing to the large number of old and more or less inefficient plants.

While I have only cited a few of the more noticeable economies, still I think enough has been said to show that wonderful possibilities exist for the South in co-operation with the trained technical man. In view of the steady drain upon the more cheaply won materials of iron making, the introduction of many of these economies cannot be long delayed; and, should a return swing of the pendulum of business bring dull times and lower prices, it may perhaps not be an unmixt evil if it serve to hasten this elimination of waste.

#### An Enormous Ventilating Plant.

The Carnegie Library Extension, at Pittsburgh, Pa., has been provided with a mechanical ventilating equipment which is one of the largest ever placed in a single building. It has an aggregate capacity of over 600,000 cu. ft. of fresh air per minute drawn in, and a similar capacity of vitiated air exhausted. To avoid excessively large units and properly sectionalize the equipment the fresh air apparatus has been arranged in 15 sections, having 19 fans, and the exhaust equipment in 21 stations with 30 fans.

The ventilation is independent of the heating, the fresh air supply systems being designed to deliver air tempered only to the normal temperatures of the rooms supplied, and the heating is accomplished by direct radiation. The only exception is the music hall, where sufficient radiation was provided to permit indirect heating if desired. The tempering coils in all of the fresh air supply systems are of sufficient capacity to satisfactorily heat the building in moderate weather, if the direct radiation system became deranged.

The supply fans, manufactured by the B. F. Sturtevant Company, Boston, Mass., are all of the steel plate, centrifugal type, the greater part having three-quarter housings with steel bottom pans. They are in all cases driven by slow speed multipolar motors. Heating coils have been fitted to all but one of the supply systems for tempering the fresh air in cold weather. They have a total heating surface of 87,042 lin. ft. of 1-in. pipe. The coils are in general made up of six and seven two-row sections, each of the Sturtevant miter type pattern. They are of 1-in. pipe screwed on 2½-in. centers into separate corrugated cast iron headers on steam and return ends. The coils are incased in jackets of steel plate, with connections to the filters and fan intakes. The tempering coils of the fresh air systems are, like the direct radiation of the heating system, under automatic thermostatic control.

# The Coke Supply of the United States.

## A Description of Present and Future Sources.

BY EDWARD W. PARKER.

Although the coal fields of the United States, including the lignite areas of North Dakota and Texas, occupy an area of approximately 400,000 square miles, and are scattered through 33 out of 50 States and Territories, the districts capable of producing high grade coking coals are of comparatively restricted extent and are confined in most part to the States included in the Appalachian system. There are some fairly good coking coals in the Rocky Mountain States and in Washington, but the areas are relatively small, somewhat widely separated, and, so far as known, have all been "patented" and are now in private ownership. The production of coke in the Rocky Mountain region represents about 5 per cent. of the total output of the United States. The coal fields of the Middle West, including Indiana, Illinois, Michigan, western Kentucky, Iowa, Kansas and Missouri, and those of the Southwest, embracing Arkansas, Indian Territory and Texas, which together occupy 185,000 square miles, or nearly 50 per cent. of the total coal area of the United States, contain very few coals of coking quality, and the little coke made there can hardly be classed as blast furnace or foundry fuel, though it can be and is used for zinc smelting and other purposes where high grade coke is not required.

We cannot, of course, tell what the future will develop in coking methods or in inventions which may solve the problem of coking what are now considered noncoking coals. The experimental work carried on at the Geological Survey coal testing plant at St. Louis has given some encouraging results along this line, but the investigations, which had to be conducted with a small battery of beehive ovens, have not been carried far enough to warrant definite conclusions. Further investigations with more satisfactory equipment will be inaugurated when the coal testing plant has been permanently located. Enough has been done already to show that certain coals heretofore considered noncoking may, under favorable conditions, with the addition of a hydro-carbon such as coal tar, be made to yield coke; but that is about all that can be said. Leaving then to the more or less remote future the matter of utilizing commercially for coking purposes the now noncoking coals and confining the consideration to the coals which will make coke under known methods, we find that the principal sources of supply are practically limited to the States of Pennsylvania, Virginia, West Virginia, eastern Kentucky, Tennessee and Alabama.

### Map of the Coal Fields.

The accompanying map illustrates how the coal fields of the United States are distributed, the lined areas indicating the country underlain by beds of brown lignite, while the true coals—anthracite, semianthracite, bituminous, semibituminous, sub-bituminous, &c.—are shown by the solid black.

The portion of the Appalachian system in which are found the coals best adapted to the manufacture of coke (under present conditions) is indicated by the boundaries made by the white line at the north and extends to the southwestern extremity of the field in Alabama. A small amount of coke is made from coal mined outside of this area and there are considerable portions of it which do not contain coking coals, but it is not possible to show these accurately on a map of this size.

The principal coking coal areas outside of the Appalachian region are shown by white crosses. Three small areas in Colorado, Utah and Montana are shown by black crosses beside them. The most important of these is the Trinidad District, Las Animas County, in the southern part of Colorado, where over 1,000,000 tons of coke was made in 1905. Colorado is the only State in the Union, outside of the Appalachian region, which produces as much as 100,000 tons of coke a year. The known areas of coking coal in Colorado, however, as well as those of the other Rocky Mountain States, are so small when compared with those of the Eastern States

that they can scarcely be considered as important factors in discussing the question of future supplies.

### Coking Coal in the Appalachian Region.

#### PENNSYLVANIA.

While a small amount of coke is made from coal mined in Elk County, to the north of Jefferson and Clearfield counties in Pennsylvania, the two latter might properly be considered as representing the northern limits of the good coking coals. Continuing from these southwesterly the leading coking coal producing counties are, at present, Cambria, Indiana, Bedford, Westmoreland and Fayette.

The last two counties contain the famous Connellsville basin and so lead, at the present time, not only the other counties of the State, but the other States of the Union and the other countries of the world, so that they might be considered as in a class by themselves. Nearly 90 per cent. of the coal made into coke at the mines in Pennsylvania and about two-thirds of all the coking coal mined and coked in the United States comes from these two counties. But, as pointed out by the writer in an article contributed to *The Iron Age* in January, 1906, and as indicated by other writers before and since that time, the Connellsville basin cannot hold out indefinitely against the enormous drafts being made upon it every year.

The "life" of the Connellsville basin at the present rate of exhaustion can hardly exceed 30 years, and naturally if the production continues to increase for the next few years as it has been doing in the recent past (50 per cent. in five years), it cannot be very long before the maximum will be reached and output begin to decline. If, however, to the Connellsville region be added what has been designated as the Lower Connellsville or Klondike District, lying altogether in Fayette County and separated from the Connellsville basin by a northeast-southwest anticline, the date of complete exhaustion may be put forward considerably—some authorities say 100 years. The activity in the combined Connellsville and Lower Connellsville region at the present time may be judged from the fact that upward of 7500 ovens are reported as in course of construction, the heavy demand and prevailing high prices encouraging increased capacity and still larger production and relegating to the rear all considerations of saving up for the future.

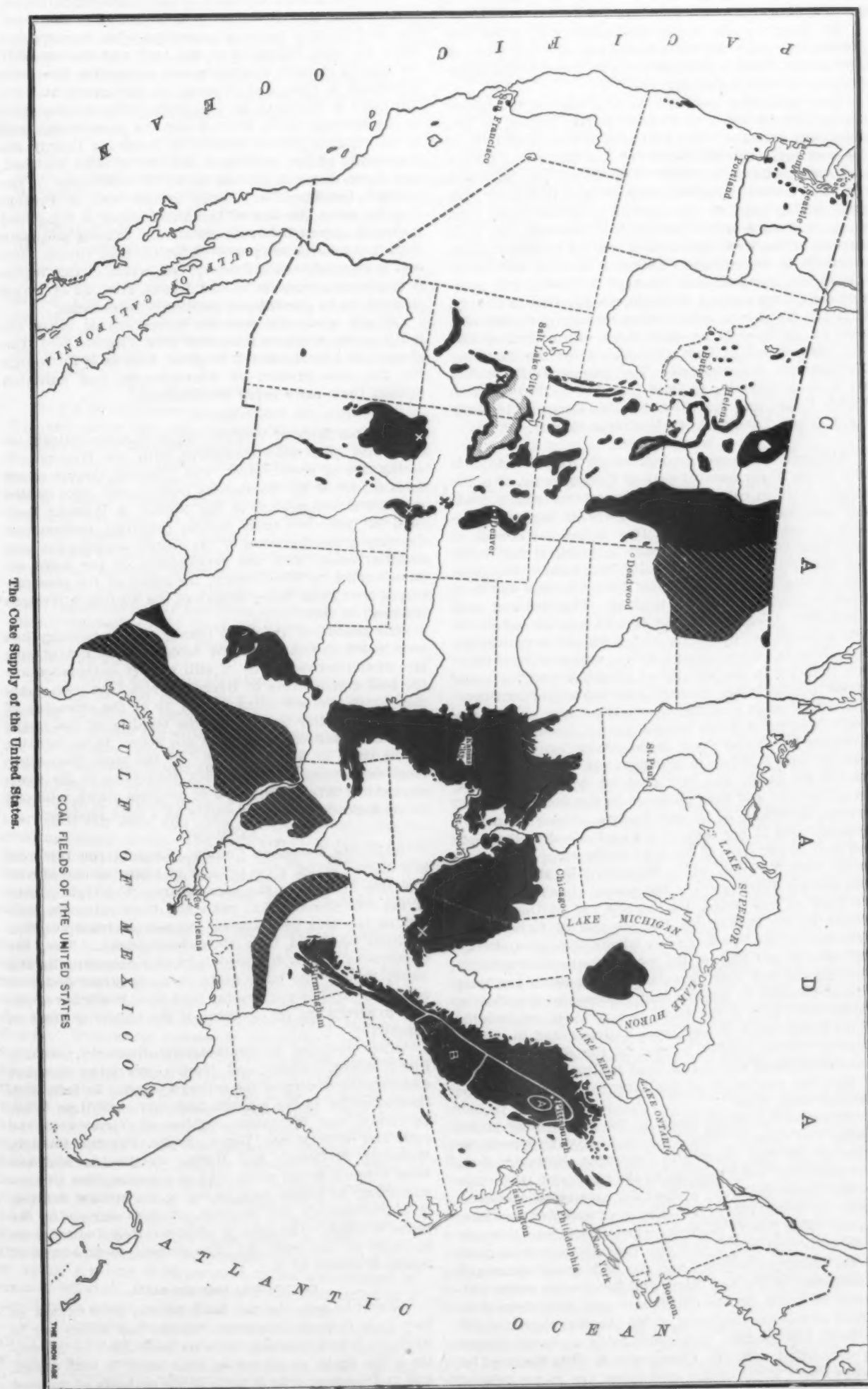
Fred. C. Kelghley of Uniontown states that at the present time the following plants are under construction in the Klondike District:

	Ovens.
Republic Iron & Steel Company.....	100
Connellsville Central Coke Company.....	200
Century Coke Company.....	50
Fayette Coke Company.....	60
Pittsburgh Coal Company.....	600
Washington Coal & Coke Company.....	100
People's Coal Company.....	400
W. J. Rainey Coke Company.....	1,300
Taylor Coal & Coke Company.....	270
H. C. Frick Coke Company.....	*1,000
United Connellsville Coke Company.....	50
W. A. Stone.....	100
Thompson Connellsville Coke Company.....	800
Tower Hill Coke Company.....	800

\* Some of these are in the old Connellsville basin.

In addition to the above, among new constructions may be mentioned 300 ovens building by the Shenango Furnace Company and 400 ovens by the Marietta Connellsville Coal & Coke Company at Ligonier; 300 ovens by the Mount Pleasant Coke Company at Latrobe, and 140 ovens by the Keystone Coal & Coke Company at Greensburg. Developments in Washington County include 250 ovens building by James W. Ellsworth & Co., 150 by the Beasmer Coke Company and 250 by the Pittsburgh-Buffalo Company. Other construction work in Pennsylvania reported by Mr. Kelghley consists of 240 ovens by the Midland Steel Company at Midland, 650 ovens by the Jefferson & Clearfield Coal & Coke Company at Earnest, 150 ovens by the Vinton Colliery Company at Vintondale,





1200 ovens at Aliquippa and 200 ovens at Soho by the Jones & Laughlin Steel Company.

Mr. Keighley also states that about 1500 ovens will probably be built on the Luzerne-Connellsville tract of 3000 acres. This is the last large tract remaining undeveloped in Fayette County.

It is but a step from the western edge of the Lower Connellsville District in Fayette County to the, as yet, practically untouched coal resources of Greene County, in the extreme southwest corner of the State, and here a large part of the development in the future may be looked for. The coals of Greene County are said to possess high grade coking qualities, but they lie at greater depth than those of Fayette and Westmoreland counties, the beds dipping to the west, and mining will be somewhat more expensive in consequence. Attention is being directed to this region, however, and the next few years will probably see a large amount of development in Greene County. It is Mr. Keighley's opinion that this district must now come in, as there is no other thick vein of coking coal left undeveloped in Pennsylvania. After the foregoing developments are completed Youngstown, Ohio, parties are already preparing to build from 800 to 1000 ovens on Muddy Creek, and the Dilworth Coke Company is building at Rice's Landing, both in Greene County.

#### WEST VIRGINIA.

Although the coke production of West Virginia is only about 20 per cent. of that of Pennsylvania, it is the second State in coke producing importance and is probably destined to be the chief source of supply in the more or less remote future. That it has not become of more relative importance already is doubtless due to the fact that Pittsburgh and vicinity had become the great iron making center before West Virginia coals had been developed and their values realized. The iron and steel furnaces of Allegheny County furnish a large and profitable market for the coals and cokes of southwestern Pennsylvania, while except for a comparatively small iron industry in the vicinity of Wheeling and the needs of the transportation interests (leaving out of consideration unimportant local factories), West Virginia is practically without a home market for its coals and cokes. Although the second State in the production of coal and coke, it ranks thirtieth in manufactures. With the exceptions above noted, and that used for domestic purposes, all of the coal and coke produced in the State is shipped to markets outside of its own borders. These "exports" probably take 75 per cent. of the coal mined in the State and over 90 per cent. of the coke produced.

In West Virginia, as in Pennsylvania, the principal coke making districts are at the present time in the southern part of the State, the counties of McDowell and Mercer in the Pocahontas District and of Fayette and Kanawha in the New-Kanawha Rivers District contributing about 80 per cent. of the total output. And notwithstanding the fact that important developments are being carried forward in Preston and Monongalia counties, in the northern part of the State, as a result of the building of the Kingwood & Morgantown Railroad, and in several counties in the central portion of the State, following the completion of the Coal & Coke Railroad, it is not likely that the supremacy of the southern districts will be wrested from them.

The most important factor in the development of the coking coal fields of West Virginia in recent years is the building of the Deepwater-Tidewater Railroad from Sewall's Point, near Norfolk, to the station of Deepwater on the Kanawha River, a short distance below Kanawha Falls. It is said that it will also be extended to the Great Lakes. The line to Norfolk, when completed (probably some time next year), will run through the coking coals of the Kanawha District and the high grade steam and coking coals of the New River and Pocahontas series. Already 85 miles on the Deepwater end have been completed, and one coking plant of 505 ovens at Page was put in blast last summer, shipments being made at present by connection with the Chesapeake & Ohio Railroad at Deepwater. Eight or ten operations are in progress of development between Page and the Guyandotte River, and most of these will be ready to produce coal and coke by the time the railroad is ready to handle the output.

The Coal & Coke Railroad, from Charleston to Elkins, is developing a large territory in the center of the State, the chief limiting factor in connection with its operations being the local character of the road and the necessity for making through shipments over connecting lines—the Baltimore & Ohio and Wabash on the north and the Kanawha & Michigan on the south. The developments in the Roaring Creek District and the more recent ones in the Tygarts Valley District of Randolph County are the results of the building of the Coal & Coke Railroad, and these districts promise to be of importance in the future. Considerable activity is observed in Preston County, along the line of the Morgantown & Kingwood Railroad. About 550 ovens are already running and more than that number are projected for the near future. The coal is mined from the Freeport bed, which in this region is remarkably pure for a considerable area, all of which is taken up by present and prospective operations.

Except along the western border coking coals are found pretty well over the entire West Virginia field. The absence of a local market, however, such as is Pittsburgh for the coke product of Pennsylvania, has militated against their more rapid development.

#### VIRGINIA.

The coal fields of Virginia, while of comparatively insignificant area when considered with her Western off-spring, are of great value. The Tazewell County mines form a part of the Pocahontas District and were opened up with the completion of the Norfolk & Western Railroad in 1882; but these became relatively unimportant (as only a small portion of the county contains the coal bearing rocks) with the development of the more extended areas in Wise County, the result of the construction of the Clinch Valley branch of the Norfolk & Western Railroad in 1891.

The growth of the Wise County coking industry has been rapid and the field has become an important one, but what promises to be of still greater importance are the coking coal areas of Buchanan and Dickinson counties, which are now being opened up by the extension of the Clinch Valley branch and the building of the South & Western Railroad, into what are known to be valuable coking coals in those counties. At the same time other large developments in the Black Mountains in the western part of Wise County are in progress which will add to the importance of that county as a coke producer.

#### KENTUCKY.

Adjoining Buchanan County (Virginia) on the west is a district which gives promise of becoming one of considerable activity in the near future. The high quality of the Pike County, Ky., coals and their value for coke making has long been known, but lack of transportation facilities has held back their development. Now, the Chesapeake & Ohio Railroad is rapidly extending its Big Sandy branch into these fields, in an apparent desire to reach and develop them by the time their rivals have been able to secure the development of the adjoining areas in Virginia.

Other counties in southeastern Kentucky, notably Floyd, Knott, Letcher and Harlan, are lying dormant awaiting the coming of the railroad prince. In fact, with these counties as the western boundary, with Lee, Wise, Dickinson and Buchanan counties of Virginia to the east, and with Mingo, Logan, Boone, Fayette, Raleigh, Wyoming, McDowell and Mercer counties in southern West Virginia to the north, may be circumscribed an area which may be looked upon as one of the greatest sources, if not ultimately the greatest, of coke supply in the years to come. The area is approximately indicated on the map by the letter B. The present great source of supply is shown at A.

#### TENNESSEE AND ALABAMA.

As will be seen, the coal fields become quite narrow as they pass through Tennessee, though they widen out in Alabama before reaching their southern limit in the center of the State. Good coking coals occur in both States, and in Tennessee coke is made in the majority of the coal producing counties. In Alabama coking is principally carried on in Jefferson, Walker and Tuscaloosa counties, the first, supporting the iron industries of Birmingham



and vicinity, being by far the most important, with 75 per cent. of the total output.

Both Tennessee and Alabama are important iron making States and, unlike West Virginia, have home markets for their coke. The coal fields will be capable of supplying the coke required for their iron industries for many years to come, but it is not probable they will be called upon for shipments to distant markets.

#### By-Product Coke.\*

The progress of the by-product coking industry depends in large measure upon the securing of profitable markets for the by-products. The disposition of the surplus gas does not usually offer a serious problem, but it is different when it comes to tar and ammonia. By-product ovens are now coking about 8,000,000 tons per annum and have caught up with the demand for their principal by-products of tar and ammonia, especially the former, and any rapid increase over the present production will immediately create a surplus. To this may be ascribed the fact that there is less new construction under way at present than at the same time for several years past.

#### THE SEMET-SOLVAY OVENS.

So far as the Semet-Solvay ovens are concerned, Mr. Blauvelt states that the Chicago, Tuscaloosa and Steelton plants, and the addition of 80 ovens to the Milwaukee plant, which were under construction the beginning of 1906, have been completed and are running, and 40 additional ovens at Chicago have been built and started, increasing that plant to 160 ovens. The year has been spent in improving the quality of the coke by better preparation of the coal and by grinding and mixing coals of different qualities in order to produce a homogeneous and strong bodied coke. On the by-product side of the work, the Semet-Solvay Company has improved its methods for recovering light oil of tar and in the application of these light oils to the manufacture and enrichment of illuminating gas.

Mr. Blauvelt also calls attention to the fact that the briquetting of fine coals, coke breeze, &c., is rapidly growing in interest throughout the country and that a number of plants are either building or already in run for the manufacture of briquettes. Coal tar pitch is almost the universal binder and has proved itself excellently adapted for briquetting under American conditions. The growth of manufactures of coal tar products is, however, relatively slow, and hardly keeps pace with the increasing supply of tar. The large supply of tar on hand has developed to some extent its use as a fuel both under boilers and for high temperature furnaces, but the uncertainty of supply and price interfere with rapid development.

There has been much interest developed during the past year in the application of tar for road building, either by incorporation into the body of macadam roads, making what is known as bitulithic pavement, or by merely coating the surface of the roads with tar after the method which has been so successfully applied in France. This latter process is simple and consists of sprinkling the road with tar heated to about 100 degrees C. Machines have been devised which deliver the tar on the road and brush it in. With these machines over 100,000 sq. ft. can be tarred in four hours. One gallon of tar will cover about 40 sq. ft. of road and produces a sort of hardening of the surface which renders the road watertight and almost entirely prevents dust. This is especially advantageous where only relatively soft material, such as limestone, is available for surfacing the road. After four years' experience with this process in France it is now in high favor with the highway engineers of that country. Experience there indicates that by its use a saving of 25 per cent. in the maintenance of roads is effected. This method has also been tried to a considerable extent on the Long Island roads.

In this country the growth of the chemical industries, which must be depended upon to absorb the by-products of retort coke making, is by no means as active as the

growth in the mechanical arts, and a considerable amount of educational work will be necessary to largely increase the present rate of consumption.

As to ammonia, it is possible that by the efforts of the Government through its Agricultural Department, coupled with a systematic propaganda on the part of the manufacturers, the merits of nitrogen as a fertilizer may be so introduced to the farmers as to cause its general adoption on the partially worn out lands of the Eastern States and those of the Middle West. This system of education has been successfully applied in England and on the Continent through a number of years. The farmers on our older lands do not realize that the proper application of fertilizers would bring back the old time yields, perhaps twofold or threefold the present ones, with the same expenditure for tilling and seed.

#### UNITED OTTO (OTTO-HOFFMANN) OVENS.

Mr. Atwater states that during the year 1906 existing plants have been operated to their fullest capacity in order to keep pace with the demands of the iron and steel markets. New plants, or additions to existing plants, all of which were undertaken during the preceding year, have been rushed to completion. The 50-oven addition to the Camden, N. J., plant went into service in July, 1906, and the 15-oven addition to the Wyandotte, Mich., plant began pushing coke in August. The 112 new ovens at the Cambria Steel Company's works at Johnstown, Pa., are approaching completion. One battery is now being heated up, and it is expected to have them all in operation early in 1907.

The Lackawanna Steel Company, which resumed operations at its plant of 232 Otto-Hoffmann ovens at Lebanon in the latter part of 1905, started up the Buffalo plant as well about the first of the year, 1906, and has been running both plants steadily since then. During the shutdown the method adopted by the company of charging the ovens with coal compressed into a cake and pushed in from the end was abandoned at both plants, and the prevailing mode of charging loose coal through openings in the oven top was resumed. The main objection to the compression method of charging the ovens was the high cost arising from the extra labor needed for compression, the loss of coal by spillage and broken cakes, and, more than all, the maintenance charges on the elaborate and extensive machinery involved. The quality of the coke produced was unquestionably good; it was, however, considered more profitable to make coke of less density, but quite sufficient strength, at a much lower cost, particularly as the capacity of the ovens was not notably increased by the compression of the charge, due to the allowance necessary for the clearance of the cake and the longer coking time needed to expel the water added while compressing. It may be stated that the compression method of charging has an unquestioned advantage in treating certain high volatile coals that without it make a soft or spongy coke, the mechanical means for accomplishing the compression have not so far proved reliable and economical enough in operation on a large scale to encourage the use of such coals, particularly when others are accessible which do not require it.

The coming into operation of the 50 new United Otto ovens at the Camden plant has occasioned the extension of the high pressure transmission system, by which gas was carried 38 miles, from Camden to Trenton, and to New Brunswick and Plainfield, some 45 miles further, or in all about 83 miles. The delivery of gas to Trenton was done with so little difficulty and so easily maintained that the extension to over double the distance is regarded more as a matter of routine than as an innovation. The extension of the domestic coke market in Philadelphia and vicinity has also kept pace with the added capacity of the new ovens, so that expectations in this direction have been fully realized.

The accompanying table shows the by-product ovens built and under contract by the United Coke & Gas Company in the United States up to date, and the uses to which the coke and gas are put. With the exception of the last 112 ovens contracted for by the Cambria Steel Company, now nearly finished, and the 564 ovens con-

\* For the information contained under this head the writer is indebted to W. H. Blauvelt, Syracuse, N. Y., and C. G. Atwater, New York City.

tracted for by the Lackawanna Steel Company, of which only 188 have been completed as yet, all the ovens are in operation:

many, and in England, among other plants, the Clarence Iron Works, made famous by the late Sir Lowthian Bell, were visited, and the by-product oven plant there in-

*By-Product Coke Ovens Built and Under Contract by the United Coke & Gas Company, 1906.*

Company.	Install- ments.	Location.	No. of ovens.	Use of coke.	Use of surplus gas.
Cambria Steel Company.....	1st.....	Johnstown, Pa.....	60.....	Blast furnace.....	Fuel and power.
Cambria Steel Company.....	2d.....	Johnstown, Pa.....	100.....	Blast furnace.....	Fuel and power.
Cambria Steel Company.....	3d.....	Johnstown, Pa.....	100.....	Blast furnace.....	Fuel and power.
Cambria Steel Company.....	4th.....	Johnstown, Pa.....	*112.....	Blast furnace.....	Fuel and power.
Pittsburgh Gas & Coke Company.....	.....	Glassport, Pa.....	120.....	Blast and domestic.....	Illuminating and fuel.
New England Gas & Coke Company.....	.....	Everett, Mass.....	400.....	Domestic and locomotive.....	Illuminating and fuel.
Hamilton Otto Coke Company.....	.....	Hamilton, Ohio.....	50.....	Foundry and domestic.....	Illuminating and power.
Lackawanna Steel Company.....	.....	Lebanon, Pa.....	232.....	Blast furnace.....	Fuel.
Lackawanna Steel Company.....	.....	Buffalo, N. Y.....	*564.....	Blast furnace.....	Fuel.
South Jersey Gas, Electric & Traction Co.....	1st.....	Camden, N. J.....	100.....	Foundry and domestic.....	Illuminating and power.
South Jersey Gas, Electric & Traction Co.....	2d.....	Camden, N. J.....	50.....	Foundry and domestic.....	Illuminating and power.
Maryland Steel Company.....	.....	Sparrow's Point, Md.....	200.....	Blast furnace.....	Illuminating.
Michigan Alkali Company.....	1st.....	Wyandotte, Mich.....	15.....	Lime kilns.....	Fuel.
Michigan Alkali Company.....	2d.....	Wyandotte, Mich.....	15.....	Lime kilns.....	Fuel.
Sharon Coke Company.....	.....	South Sharon, Pa.....	212.....	Blast furnace.....	Fuel.
Zenith Furnace Company.....	.....	Duluth, Minn.....	50.....	Blast furnace.....	Illuminating.
Total.....			2,380		

\* Not completed.

The ovens at Glassport, Pa., supply illuminating gas to McKeesport and those at Everett, Mass., to Boston and vicinity; those at Hamilton, Ohio, supply the town of Hamilton exclusively, the former municipal gas plant having gone out of business. The ovens at Sparrow's Point, Md., supply illuminating gas to Baltimore, and those at Camden, as already mentioned, supply an extended distribution system including Camden, Bordentown, Woodbury, Trenton, New Brunswick, Plainfield and various smaller intermediate towns. At all the plants the illuminating gas is separated from the fuel gas used for heating the ovens and treated in an entirely distinct condensing system, the richer portion of the gas being that used for illuminating purposes. This principle of the division of gases, inaugurated by the United Coke & Gas Company, has come to be generally recognized as the best method of obtaining illuminating gas from the by-product ovens. By its use over 5000 cu. ft. of 18 to 19 candle-power gas has been obtained from a net ton of medium volatile coal, under regular operating conditions and without enrichment.

#### THE FUTURE OF THE BY-PRODUCT OVEN.

No new by-product coke oven plants have been undertaken during the year, but this is far from indicating any growth of sentiment against this type of oven. On the contrary, invariable success of the coke in the blast furnace has strengthened the conviction in the minds of steel men that to this form of oven the industry must ultimately come. The recent large projects for steel plants, as that of the United States Steel Corporation at Gary, Ind., and the New York State Steel Company at Buffalo, do not hesitate to follow in the steps of the Lackawanna Steel Company, and commit themselves to by-product ovens for their coke supply. Indeed, the strong tendency to locate iron and steel works at a point where ore from the Lake regions can be unloaded directly from the vessel compels the choice between shipping the coke from the coke fields by rail, or of shipping the coal to the blast furnace, and coking it there. The shipping of coal is so much more economical, by reason of easier handling, than the shipping of coke, that this reason alone would probably prevail, even were the coking done in bee-hive ovens. These are, of course, inadmissible in most available districts, particularly where model manufacturing towns are projected. On the other hand, the by-product oven offers not only a wider scope in the selection of coal, but also a larger coke yield from a given coal (particularly if the coal be low in volatile) and a considerable saving in cost of operation due to the value of the gas and by-products recovered.

Some interesting side lights are cast on this question by the printed reports of some members of the American Institute of Mining Engineers, who visited England and Germany in the past summer. The prevalence of the by-product oven was a point particularly noted in Ger-

spect. It will be recalled that a great deal of the opposition to the by-product oven among blast furnace men, both here and abroad, was based upon Sir Lowthian Bell's statements as to the lack in by-product coke of deposited graphitic carbon, to which he ascribed the supposedly greater ability of bee-hive coke to resist the dissolving action of the gases in the blast furnace. This opinion was afterward relinquished by Sir Lowthian, and the establishment of by-product coke ovens at his works and his full indorsement of by-product coke in the blast furnace followed, based upon his own experience with this fuel at this plant. It is gratifying that so distinguished a metallurgist should have proved as frank in recommending by-product coke, on better acquaintance, as he had formerly been in condemning it.

Under the market conditions prevailing in this country, it is but natural that all the bee-hive ovens that have been abandoned or allowed to run down, because adjacent coal mines were worked out, or nearly so, should be put into shape to make coke at any reasonable cost, and relieve the immediate need. At present prices there is some justification for the operator who expects to build bee-hive ovens in three months and pay for them in six. Opportunism such as this may result in fortunes made "overnight," but it is a flimsy foundation for a stable and healthy industrial growth. The full measure of prosperity in the fat years and the ability to do more than barely exist through the lean ones are the result of forethought and preparation of a different character.

#### Women Chain Makers of England.

J. Fitch, secretary of the Chain Makers' and Chain Strikers' Association in Great Britain, has commented quite severely on the condition of the women workers in the chain making trade of the Black Country, the district surrounding Birmingham, England. After a period in which conditions among these workers changed for the better, they are now said to be as bad as at any time. The average wage for a week's work, with long hours six days in the week, is between 4 and 5 shillings—from \$1 to \$1.25.

Secretary Fitch, referring to the evils of sweating and of competition for the chance to work, severely reflects on workmen as well as employers. Not a few of the women have husbands who earn good wages. "I was pained to find," he says, "among this class, wives of members of the Chain Makers' and Chain Strikers' Association who, I know for a fact, earn more in three hours than their wives earn in a week. Some of these men brag about being good trade unionists when they are in a public house, but they are quite content to allow their wives to toil and slave in a chain shop for a mere pittance. Such men are not worthy to be members of a trade union."



## Mexican Railroad and Business Notes.

### Opening of the Tehuantepec Route.

DURANGO, January 31, 1907.—The railroad across the Isthmus of Tehuantepec, known as the Nacional de Tehuantepec, was formally opened for through traffic January 1. Some little time previous to that date President Diaz issued a decree announcing the pending operation of the new line and indicating the laws and procedure governing the movement of traffic. Full details regarding the regulations relative to the movement of freight over the road are given in the Government publication, the *Diario Oficial*.

Sir Weetman Pearson, the head of the English company that reconstructed the line, and who is associated with the Mexican Government in its operation, has arrived to take part in the ceremonies attending the formal inauguration of the line, which will take place upon the arrival of the first freight steamers at the two terminal ports—Salina Cruz and Coatzacoalcas.

### Industrial and Financial Conditions.

In the course of his budget statement submitted to Congress a short time ago, Minister Limantour gave an exhaustive résumé of the financial situation and of the business outlook. The estimates of normal revenue for the fiscal year 1907-08 total \$98,835,600, and of expenditures \$92,966,595.02, leaving a surplus of \$5,898,404.98. In view of the existing prosperity, the Minister announced the intention of the Government to reduce certain of the taxes and to increase the salaries of a number of Government employees.

### The Labor Situation.

The stress to which employers of labor have been put to obtain native workmen has induced several of them to import large numbers of Japanese under contract. Several shiploads of these have arrived and been distributed to various points in the Republic. Some have gone to the Coahuila coal mines, others to the railroad construction camps and a number to the hot country plantations. Many of these newcomers who deserted their work soon after their arrival made efforts to enter the United States, some of them succeeding in doing so. It appears that these deserters had availed themselves of the easy means of transportation offered by the labor contractors to cross the Pacific, with no honest intention of working at the task assigned to them when landed in Mexico.

### Railroad Concessions and Construction.

The lines of the Mexican National will be augmented by the construction of a railroad 31 km. in length between Jarita, south of Laredo, to Colombia. Two years are allowed for the completion of the road, which will be chiefly engaged in the moving of coal.

Good progress in construction work is reported as being made upon the Morella & Tacambaro Railroad. Delay has been caused by the nonarrival of steel rails. Twelve hundred workmen are engaged in grading in six camps.

Activity in construction work is also visible in the State of Chihuahua, where, in addition to the lines of the Kansas City, Mexico & Orient, work is being pushed upon a number of others. A large force of men is at work on the extension of the main line of the Rio Grande, Sierra Madre & Pacific, from San Diego to Temosachic. This extension will be about 160 miles in length. It is proposed to construct branch lines from the place last named to Terrazas and to Tonichi.

It is announced from Guadalajara that the main line of the Cananea, Yaqui River & Pacific's Guaymas-Guadalajara extension has been completed to Guadalupe, and the roadbed graded to Navajoa. Grading has also been commenced on the line from Navajoa to Culiacan, the capital of the State of Sinaloa.

Work on the Pan-American Railroad is being pushed at the rate of 1 km. a day, according to the testimony of President Doak. That gentleman said in an interview a few days ago: "The track is now completed to the town of Mapaxtepec and will be completed to the Guatemalan border by September 1 of next year."

A report from Vera Cruz is to the effect that the National Railway Company intends to secure possession of a short line of road running from Apizaco to Tlaxco, which, it is added, will be extended to the Sierra de Puebla and to Vera Cruz and Tuxpan. The same company has placed additional engineering parties in the field upon the location of the Hidalgo & Northeastern extension from Beristain to the coast of Tuxpan. The projected line from Guadalajara to Chamela, on the Pacific Coast, for which the concession is held by the Jalisco Railway Company, has been located for a distance of 20 km. east from Autlan and the maps submitted to the Government.

W. C. Bradbury & Co. of Denver, Colo., have obtained a contract for the construction of the American-Mexican Railroad from Phoenix, Ariz., via Tucson to Nasco, a distance of 250 miles.

Contracts for construction work upon its lines in Mexico have been given by the Kansas City, Mexico & Orient Railway Company covering 62 miles between Aguatos and Las Tascates, and from El Fuerte to La Junta, 55 miles, as well as for considerable mileage in Kansas and Texas.

A railroad is to be constructed in the State of Campeche, between Teambo and Bolonchen, a contract having been made between the Governor of the State and Saturnino Guzman Nestre for the work, and approved by the Legislature.

### Industrial Notes.

Complaint is heard among dealers in machinery and supply agents on the score of the delay experienced in the filling of orders sent to the United States. This note is thus voiced by a daily journal published in the City of Mexico:

The difficulty of getting any orders filled in less than four or six months is felt very seriously at present in Mexico. Most of the stocks of machinery in the city are low, as recent demands upon them have been very heavy. The present year has already brought a large number of orders for all kinds of machinery, tools and appliances, for mining and industrial uses, and the prospects appear to be that the general revival in all lines that will shortly occur throughout the republic will make the scarcity of these goods still more severely felt.

It is reported from Chihuahua that a syndicate of Boston capitalists has taken an option on large deposits of iron ore in the Coyanne District of that State.

A concession has been applied for by Alexander Rueff for the manufacture of steel files in the State of Mexico. If granted the concession, Mr. Rueff intends to invest not less than \$100,000 in the enterprise and to begin the erection of the plant within six months.

S. Pearson & Son, Limited, have obtained a concession to utilize 340,000 liters of water per second and to erect the necessary power plant in the canton of Jalapa, Vera Cruz.

A concession to drain Lake Lerma and to use the water for irrigation purposes has been granted to Sr. Gumesindo Enriquez, a lawyer of the capital.

That some of the great land owners of Mexico are progressive is shown by their adoption of modern inventions and discoveries. As an instance of this may be noted the recent installation of an electric plant upon the hacienda El Castillo, for the purpose of supplying power to operate irrigating pumps.

The plant of the Mexican Car & Foundry Company, at Hutchison, near the City of Mexico, will hereafter be operated by electric power obtained from the Mexican Light & Power Company, the order for the requisite electrical outfit having been placed with a local supply firm.

J. J. D.

Comparisons between the outputs of projectiles from motor driven and belt driven lathes show an advantage of 47 per cent. in favor of the former. At the works of the Firth-Sterling Steel Company the turning on a 6-in. projectile required 16 min. with the motor driven lathe and 22 min. for the other, an increase of 38 per cent. Similarly, for a 7-in. projectile the time of turning was respectively 19 min. and 29 min., an increase of 53 per cent. With the 8-in. projectiles the time was reduced from 35 min. to 24 min., an increase of 46 per cent.

## Thermometers and Pyrometers.\*

### Some of Their Industrial Applications.

BY ROBERT S. WHIPPLE, CAMBRIDGE, ENGLAND.

It cannot be denied that accurate temperature measurement is still a problem of considerable difficulty. Temperature is not a measurable quantity in the strict sense of a length or a mass which assumes the existence of two laws—that of equality, and that of addition. Temperature obeys the first of these laws. Two bodies in temperature equilibrium with a third will also be in equilibrium with each other. The other law does not hold. It is impossible by placing together several bodies at one temperature to realize a system equivalent, from the point of view of exchange of heat, to a body at a different temperature.

Many scales of temperature have been proposed, but the gas scale is the one now universally adopted, and readings obtained by any type of thermometer—electrical, expansion, or optical—are reduced to temperatures on the gas scale. This has been adopted as the standard because gas of the same purity can be reproduced at any time; the dilatation of the gas, which defines the scale of temperature, is sufficient for accurate measurement; and the scale is practically identical with the thermodynamic scale.

Fortunately, it is not necessary in every day life to use an elaborate gas thermometer, with its adjuncts of telescopes, microscopes and standard barometer. A thermometer which has been carefully standardized at certain known temperatures answers the purpose. The writer believes that the Carnegie Institute at Washington possesses, perhaps, the most accurate gas thermometer in the world. Dr. Arthur L. Day has succeeded in eliminating various sources of error which have previously been present in these thermometers. Thermometers and pyrometers are generally standardized by means of fixed points of fusion and ebullition which have been determined by the gas thermometer.

It is, perhaps, for this very reason that many of the discrepancies in high temperature thermometry have arisen. Precise measurements depend on the accuracy to which these fixed points are known. It is at present impossible to determine many of these directly on the gas thermometer, as even the platinum-iridium bulb of the latter becomes porous at extremely high temperatures. High temperature thermometry is badly handicapped by scarcity of materials for thermometer bulbs capable of standing high temperatures. Platinum—the great stand-by—has been shown by Sainte-Claire-Deville and others to be very permeable to hydrogen—a gas which is generally present where combustion is incomplete. Fortunately, even when red hot, it is practically impervious to all other gases; so that if nitrogen is employed as the gas whose volume is to be measured, and the platinum is suitably protected from hydrogen, accurate observation may be made. Porcelain must be glazed to ensure nonpermeability, and the glaze cannot be considered impermeable above 1100 degrees C. Water vapor passes comparatively rapidly through unglazed porcelain.

One cannot help being struck with the interdependence of all branches of scientific work. The accurate determination of the value of the meter was the means of producing the most accurate thermometry the world has seen; because to determine the length of a standard bar its temperature should be known accurately. Thus the preliminary work on the measurement of the meter produced the masterly work of Dr. Ch. Guillaume on the mercury thermometer and his valuable treatise, "Thermométrie de Précision."

The details of the construction and working of a gas thermometer cannot be entered here, and those who are especially interested are referred to Dr. Guillaume's book, or to Dr. Burgess' translation of M. Le Chatelier's book, "High Temperature Measurements." The writer

acknowledges his indebtedness to the latter book for some of the facts mentioned in this paper.

The various means of measuring temperature in general use are roughly summarized in the accompanying table. These methods are hereinafter treated more fully in detail with their particular applications:

#### Types of Thermometers in General Use.

Type.	Range in degrees Cent. over which they can be used.
Gas .....	0 to 1,000
Flow of air .....	0 to 1,600
Mercury (Jena glass and nitrogen) ..	40 to +500
Spirit .....	100 to +40
Unequal expansion of metal rods ..	0 to 500
Contraction of porcelain .....	0 to 1,800
Thermo-electric—Those depending on the electromotive force developed by the difference in temperature of two similar thermo electric junctions opposed to one another.	Galvanometric .... 0 to 1,600 Potentiometric .... 0 to 1,600
Electric Resistance—Those utilizing the increase in electric resistance of a wire with temperature.	Direct reading on indicator ..... 0 to 1,400
Radiation—Those depending on the heat radiated by hot bodies.	Bridge and galvanometer ..... 0 to 1,400
Optical—Those utilizing the change in the brightness or in the wave length of the light emitted by an incandescent body.	Thermo couple in focus of mirror. 0 to 10,000 Bolometer ..... 0 to 10,000 Incandescent filament in telescope. 0 to 2,000
Calorimetric—Those depending on the specific heat of a body raised to a high temperature.	Nicol with quartz plate and analyzer ..... 0 to 2,000
Fusion—Those depending on the unequal fusibility of various metals or earthenware blocks of varied composition.	Copper or platinum ball with water vessel ..... 0 to 1,500 Alloys of various fusibilities ..... Seger cones ..... 0 to 1,980

Dr. Chree, in some valuable "Notes on Thermometry," published in the *Philosophical Magazine*, March, 1898, makes the statement that "the ideal mercury thermometer is one which accommodates itself at once and completely to the temperature it is for the time being exposed to, and which, when exposed to a given temperature, supplies an invariable reading." In the writer's opinion there could not be a better definition of what is required from any form of thermometer.

#### Expansion Thermometers.

Although the gas thermometer is essentially an expansion instrument, the mercury-in-glass thermometer must be considered the expansion instrument *par excellence*. The mercury thermometer, as generally used, falls short of Dr. Chree's ideal, but Dr. Guillaume has brought it very nearly the ideal, as, thanks to his work, it is now possible to measure temperature with a mercury thermometer to an accuracy of 0.001 degree C. Now that nitrogen is being introduced into the stem of mercury-in-glass thermometers they may be used up to temperatures as high as 500 degrees C.

An expansion thermometer of general interest measures temperature by the unequal expansion of two materials, such as steel and porcelain or graphite. A graphite rod is placed at the bottom of a closed steel tube, a small steel tube being connected to the upper end of the graphite rod. Through various simple mechanical movements the differential expansion of the two rods is indicated on a dial. These thermometers are useful up to temperatures of about 1200 degrees F.

The Uehling-Steinbart pyrometer is one of the most ingenious yet constructed, and its inventors are to be congratulated on developing their ideas and on the success obtained by the pyrometer. As the writer has had no practical experience with this pyrometer, however, he dislikes to discuss it in detail.

#### Thermo-Electric Pyrometers.

The second group, the thermo-electric thermometers, are those in which is measured the electro-motive force developed by the difference in temperature of two similar thermo-electric junctions opposed to one another. Bec-

\* Address delivered before the Syracuse Chemical Society and the Technology Club, Syracuse, N. Y., November 9, 1906.



querel, as far as is known the first to use this method of measuring high temperatures (1830), used a platinum-palladium couple. His son, Edmond Becquerel, was the first to realize the importance of using a high resistance galvanometer with a thermo couple. The electro-motive force is a function of the temperature, and, as it is the current strength that is measured, it is important that the resistance of the whole circuit should be as nearly as possible constant—i. e., the change in resistance of the couple itself should be small as compared with the change in the rest of the circuit. For some time the thermo-electric method was regarded with suspicion, Regnault having observed such irregularities in the couples in use that he condemned the method unreservedly.

To M. Le Chatelier and Sir William Roberts-Austen is owed knowledge as to what metals to use for couples, what formulae to employ and what apparatus to use. Le Chatelier showed that very few combinations of wires make satisfactory couples. Iron, nickel, palladium and their alloys are absolutely unsuited for measuring high temperatures, since when heated they give rise to parasitical currents, which may be relatively intense. He found that platinum and its alloys with iridium and rhodium are, fortunately, free from these faults. Of all the couples those consisting of platinum and an alloy of platinum, with 10 per cent. of rhodium, are the most durable for use at extremely high temperatures. On the other hand a platinum-platinum 10 per cent. iridium couple gives a larger electro-motive force, and therefore a more open scale.

Some recent work by Holborn and others has shown that the change (decrease) in the electro-motive force of two of the latter class of thermo couples, due to glowing at 1100 degrees C. for 8 hr. amounted to 6 and 14 per cent., while the change (increase) in the electro-motive force of a couple of the former type exposed to similar conditions was only 0.5 per cent.

Some exceedingly interesting work by Dr. W. P. White of the Carnegie Institute shows that the iridium sublimates slowly at temperatures above 1200 degrees C. and enters and contaminates the platinum side of the thermo element. The effect of this contamination is to make the element read too low. Iron vapor has been shown to have the same effect. It has long been known that unprotected platinum, when exposed to furnace gases, deteriorated rapidly, which shows very clearly the importance of protecting the couples with glazed porcelain tubes.

Two methods are generally employed to measure the electro-motive force of a couple—the potentiometric, or the method of compensation, and the galvanometric. The first method is rather cumbersome for general workshop use, but is undoubtedly the more accurate. The galvanometric method is simplicity itself, the cold ends of the thermo-couple wires being connected directly to the galvanometer terminals. If the resistance of the circuit is constant the deflections will be proportional to the electro-motive force. The majority of direct reading instruments employ a sensitive D'Arsonval galvanometer, the coil of which either carries a mirror reflecting a spot of light on a scale or a boom pointing to a scale. The galvanometer scale is divided in millivolts and degrees Centigrade.

A simple form of recorder, shown in Fig. 1, to which the name "thread recorder" has been given, is one in which the galvanometer pointer is depressed every minute, forcing an inked thread against the paper leaving a small ink mark on it. The inked thread is drawn by a winding mechanism to expose a fresh part. This method of recording gives rectangular co-ordinates and entirely prevents the blotting or smudging of the record. The clock work mechanism can be made to depress two or more galvanometer booms simultaneously, the various galvanometers being connected to different thermometers. The records obtained are entirely independent of each other, and the thermometers may be working over widely different ranges. The record shown in Fig. 2 was obtained by a platinum-platinum rhodium couple in conjunction with a thread recorder.

The advantages of the galvanometric method are portability and simplicity; the disadvantages, closeness of scale and the fact that an error is introduced by the variation in resistance of the couple. The potentiometric method has the advantages of an open scale and that no error is introduced by the resistance of the couple. The only serious disadvantage is that the apparatus must be worked in a laboratory and requires a trained observer. Prof. H. L. Callendar has designed a recording poten-

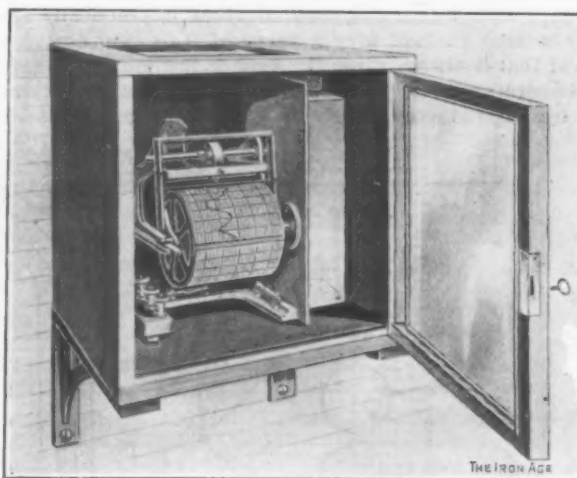


Fig. 1.—A Patent Thread Recorder for Recording Temperatures.

tiometer for use with thermo couples, which is explained later.

A description of Dr. Stansfield's extremely ingenious method for obtaining sensitive records of recalescent points was published in the fifth report of the Alloys Research Committee. Two junctions are employed; one is placed in a piece of steel, and the other in a piece of fire clay or copper. A sensitive galvanometer connected to both thermo junctions measures on a large scale the difference between their temperatures. Magnified records of the evolution of heat in the steel part can thus

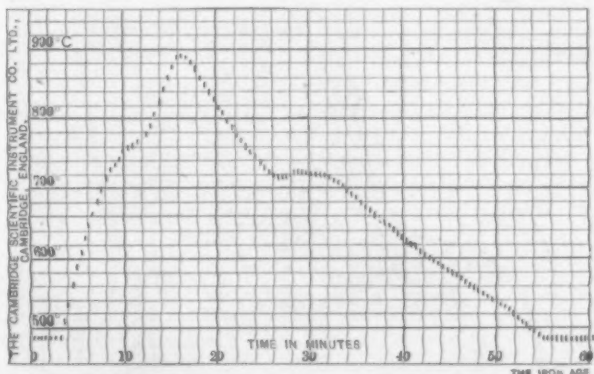


Fig. 2.—Recalescence Point Obtained with a Platinum-Platinum Rhodium Couple and Patent Thread Recorder.

be obtained, which are not affected by the general fall of temperature of the system.

#### Electric Resistance Thermometers.

The electric resistance thermometer was first proposed by Sir William Siemens in the Bakerian Lecture of 1871, and it immediately came into general use in metallurgical work. Unfortunately, it was found that the pyrometer did not satisfy the fundamental criterion of always giving the same indication at the same temperature, and it was rather severely condemned by a committee of the British Association in 1874 who showed that these changes in resistance were due to chemical alteration in the platinum and defective contacts between the fine wire of the coil and the comparatively heavy conducting leads.

In 1886 Professor Callendar showed that if the platinum is supported on a mica frame, in section that of a

cross with equal arms, there is perfect insulation without any cause of alteration. He also showed that all joints in the wires should be made by fusion. Metallic solderings are volatile and attack platinum, and screw joints become loose. An excellent summary of Professor Callendar's work is contained in a paper by him published in the *Philosophical Magazine*, February, 1899, entitled, "Notes on Platinum Thermometry." The results of his researches—since confirmed by many workers—show that the platinum resistance thermometer, if protected from strain and contamination, is practically free from zero changes over a range of 0 to 1200 degree C. and that it always gives the same indication at the same temperature. He also showed that different platinum wires agreed very closely in giving the same value of

tures on the platinum scale to the gas scale. It is necessary to know the law connecting  $T$  and  $pt$ . They are, of course, identical at 0 and 100 degrees, and experiment has shown that the formula:

$$T - pt = S \left\{ \left( \frac{T}{100} \right)^2 - \frac{T}{100} \right\}$$

expresses the curve of the relationship between them in other parts of the scale. The value of  $S$  depends on the purity of the platinum wire used; it can be obtained from observations at three known temperatures. A table of corrections is used to convert temperatures on the platinum scale to those on the gas scale, or the instruments used with the thermometers read directly on the gas scale. In an account of a comparison of platinum thermometers and thermo junctions with the gas thermometer at the National Physical Laboratory, Dr. Harker describes the method of comparing the three types of thermometers and gives tables showing the remarkable agreements between them up to 1000 degrees C.

The platinum resistance thermometer consists of a fine platinum wire wound on a mica frame, connected by stout copper or platinum leads to terminals in the head of the thermometer. Two similar leads, but unconnected to the coil, pass through the whole length of the thermometer and act as compensating leads. By this means no error is introduced by the variation of

the temperature of the wires connecting the thermometer with the indicator or recorder. The diagram, Fig. 3, explains the general arrangement for the use of Callendar & Griffiths' resistance thermometer. The thermometer coil forms one arm of the bridge, while the compensating leads and the balancing coils form the opposite arm. A pair of equal ratio arms are generally used.

If temperature measurements are to be made with a resistance thermometer to a high degree of accuracy a specially designed Wheatstone bridge and a sensitive galvanometer must be employed. This arrangement, however, is too cumbersome for general commercial use, and the writer designed a bridge, which is a modification of one invented by Callendar and Griffiths, in which the temperature values are read directly in degrees Centigrade, and rapidly varying temperatures may be followed. The instrument, Fig. 4, is especially useful for measuring the temperatures of boiler flues, general testing and annealing work, &c. One of these bridges or indicators can be connected in turn through a switchboard with a large number of thermometers. A recording apparatus designed by Professor Callendar has already been referred to. The instrument consists of a Wheatstone bridge or potentiometer, in which the movement of the slider along the bridge wire is automatically effected by delicate relays worked by the current passing through the galvanometer between the bridge arms. According as the moving coil of this galvanometer is deflected in one direction or the other a relay circuit is connected through one or other of two electro-magnets. Each of these magnets is mounted on a clock, the movement of which is controlled by a brake. When a current passes through a magnet this brake is lifted, allowing the clock work to revolve. The clocks are connected by differential gearing with a recording pen, which is pulled in one direction or the other, according as the brake is lifted from the corresponding clock. The bridge slider moves with the pen and tends to restore balance.

The details of construction and the electrical connections of the Callendar recorder were described in the *London Engineering* for May 26, 1899. The Callendar recorder can be used for determining the recalcrescent points of steels and for general thermometric work. It can be used either with a thermo couple or with a resistance thermometer.

The uses to which a satisfactory recorder can be put are almost innumerable. In Fig. 5 two recalcrescent curves are produced; one record (A) being characteristic of a mild grade of steel (0.35 per cent. carbon), the other (B) of a tool steel. A comparison shows clearly the

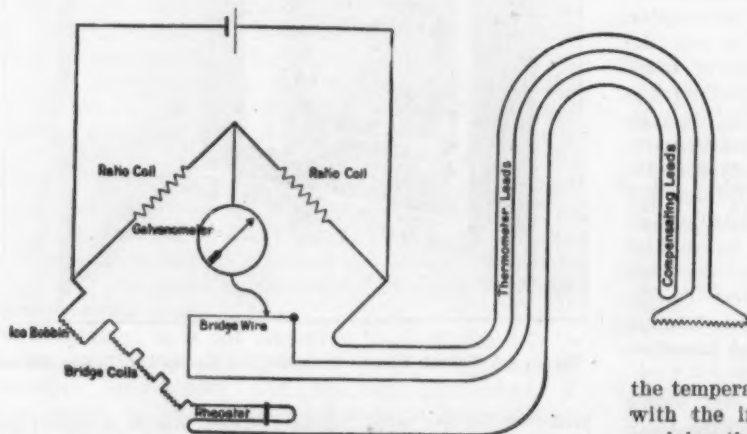


Fig. 3.—Diagram of Connections for a Callendar & Griffiths Resistance Thermometer.

any temperature on the platinum scale, although they differed considerably in the values of their temperature coefficients.

Professor Callendar pointed out that if  $R_0$  denote the resistance of the spiral of a particular platinum thermometer at 0 degrees, and  $R$  its resistance at 100 de-

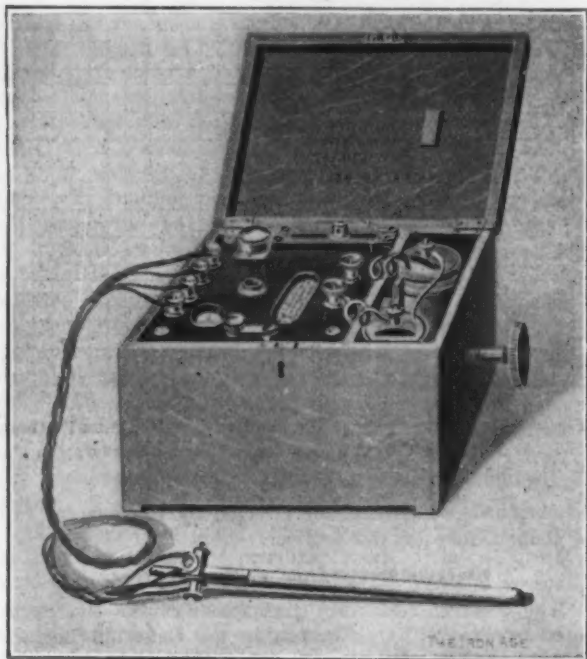


Fig. 4.—A Resistance Thermometer Connected to a Whipple Patent Temperature Indicator.

grees, there may be established for the particular wire a temperature scale, which may be called the scale of platinum temperatures, such that, if  $R$  be the resistance at any temperature on the air scale, the temperature on the platinum scale will be  $\frac{R - R_0}{R_1 - R_0} \times 100$ . For this quantity he employs the symbol  $pt$ , its value depending on the sample of platinum chosen. To reduce tempera-



value of such records in discriminating between different qualities of steel.

#### The Heat Treatment of Steel.

Any one who has had anything to do with annealing knows the difficulty of maintaining ovens or furnaces at a constant temperature, because the fireman so often will not properly perform his duty. The record, Fig. 6, was furnished by a firm using several of these recorders, and shows how they keep a check on the fireman. The difference in the firing between the two men—the old

#### Heat Radiation and Optical Thermometers.

Many workers have endeavored to evolve a pyrometer that would measure the temperature of a source of heat without the necessity of inserting a "poker," as the ordinary pyrometer is called. Among optical thermometers the one designed by Professor Wanner is perhaps the most successful. It is based on the photometric comparison of the intensity of the light emitted by the incandescent body whose temperature is sought, with the light of a standard comparison lamp. Instead of using

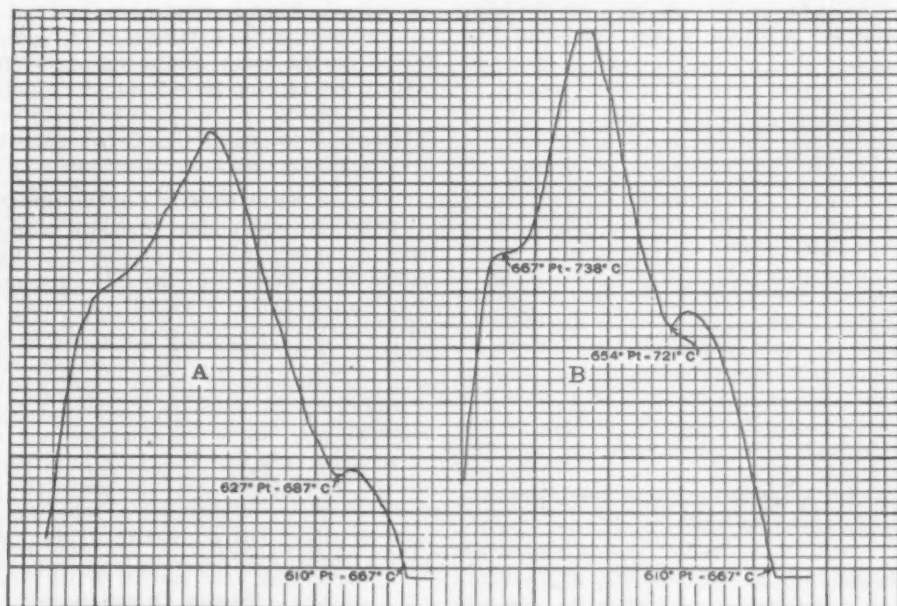


Fig. 5.—Recalescent Curves Obtained with a Resistance Thermometer.

experienced hand (B) and the new man (A) who fires more frequently—is very striking.

Resistance thermometers can be placed at a considerable distance from the reading instrument and for this reason they have been found useful for measuring temperatures of the soil and the temperature of cold stores. They are said to have been used with Callendar recorders in some experiments in freezing the soil under the Hudson River through which the new Pennsylvania Railroad tunnel is passing. Heycock and Neville, whose work on the determination of the melting points of metals is so well known, have recently been investigating the behavior of the copper-tin alloys. This important research, in which many different alloys were included, was carried

monochromatic light, the light is spread out into a spectrum by a direct vision spectroscop, and a small region in the red is used. The working standard source of light is a small incandescent lamp. The method of reducing the two fields of light from the hot body and the electric light respectively to the same intensity, is first to polarize them in planes at right angles to each other, and then the intensity of each can be varied by viewing them through a Nicol's prism, which can be rotated. This angular rotation of the prism is then a measure of the intensity of the light, and therefore of the temperature. The incandescent lamp can be standardized against an amyl-acetate flame. Owing to the loss of light in the optical system of the pyrometer, the lower limit of tem-

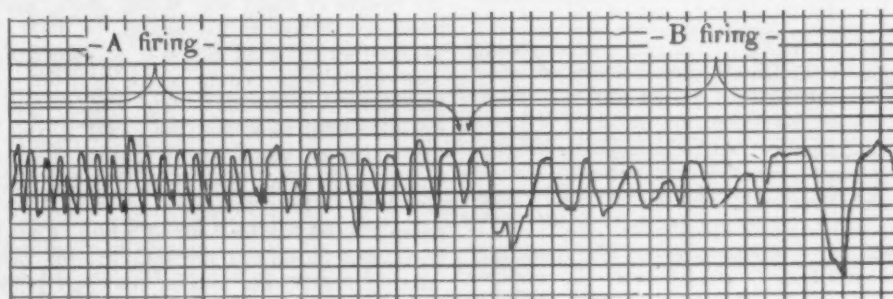


Fig. 6.—An Annealing Furnace Record Showing the Difference in the Firing of Two Men.

out by means of these thermometers and a Callendar electric recorder. In the latter part of 1903 Sir John Murray made a series of experiments to determine the temperature of Loch Ness. The thermometer was immersed to a depth of 200 ft., and the temperature was recorded on an instrument at a distance of 1200 ft. from the thermometer. The thermometer was attached to a cable wound on a drum, which was fixed to the deck of a boat moored in the loch, and the cable was connected to the shore cable by an elaborate mercury cup.

perature measurement with the Wanner is about 900 degrees C., so that it unfortunately cannot be used for determining the hardening and annealing temperatures of many steels. It has also the drawback that the setting depends upon the color judgment of the observer. The instrument is capable of considerable accuracy.

In Mesuré and Nouel's pyrometer telescope an attempt is made to control temperatures by taking advantage of the rotation of the plane of polarization of light passing through a quartz plate cut perpendicular to its

axis. The angle of rotation is directly proportional to the thickness of the quartz, and approximately inversely proportional to the square of the wave length. In general the field of view will be colored, and by turning the analyzer the color observed will change, because the light, all polarized in the same plane, emerging from the first Nicol prism, is polarized by the quartz in various planes depending on the wave length, so that the angle between the two prisms determines the color that will be seen. This instrument has the advantage over others that it has no auxiliary apparatus, but it lacks sensitiveness.

An ingenious optical pyrometer has been designed by Holborn and Kurlbaum, working at the Physikalische-

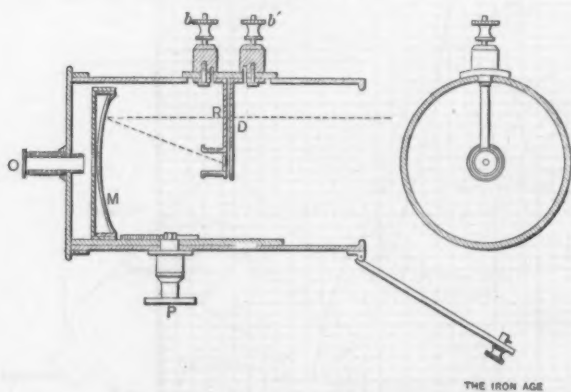


Fig. 7.—Longitudinal and Cross Sections of a Féry Radiation Pyrometer Telescope.

Technische Reichsanstalt. An incandescent filament is placed in the focus of the eyepiece of a telescope, and by an object glass an image of the source of heat is thrown into the same plane. The current passing through the filament is regulated by a rheostat until the filament is no longer visible on the image of the source of heat, when both sources of light will have the same intensity.

The Morse gauge is a simplified form of the same thermometer.

The most successful radiation pyrometer is that invented by Prof. C. Féry, of Paris. As shown in Fig. 7, the heat radiated by a hot body, or which passes through a hole in the furnace wall, is focused by a concave mir-

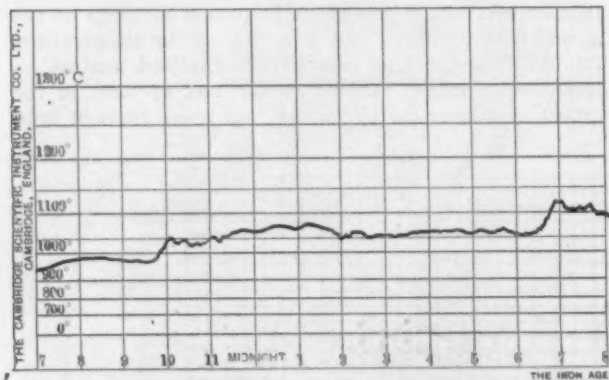


Fig. 8.—A Temperature Record Obtained with a Féry Radiation Pyrometer and Patent Thread Recorder.

ror upon a thermo-electric couple, whose rise in temperature is measured. The galvanometer scale is based upon the Stefan-Boltzman law: "The radiant energy emitted by a black body is proportional to the fourth power of the absolute temperature of the body." The instruments are so arranged as to be uninfluenced, within wide limits by the size of the hot body or observation hole, or the distance from the hot body or furnace. A recording galvanometer can be used with the Féry radiation pyrometer, giving a temperature record like Fig. 8.

Professor Langley designed a radiometric apparatus under the name of a bolometer, which has since been largely developed by Professor Callendar for measuring

heat radiations, more particularly solar radiations. It consists of a differential pair of flat platinum thermometers, one blackened and the other bright, placed side by side in the same horizontal plane in a hermetically sealed glass vessel. The difference of temperature between the two, automatically recorded on a Callendar electric recorder, is approximately a measure of the intensity of the vertical component of the radiation to which they are exposed. It has already been shown with these instruments that the heat received by reflection from the sky under certain conditions may amount to more than 40 per cent. of the whole vertical component. They have also shown what a large proportion the negative radiation is of the amount of radiation falling on the earth during the day. The radiation is continually varying throughout the night. These instruments have been successfully employed to measure boiler radiation, more especially to compare the relative efficiency of various boiler laggings.

#### Calorimetric Thermometers.

With the well-known Siemen's water calorimeter a ball of copper, iron, or platinum of known weight is heated in a furnace to the latter's temperature, and is then transferred to a vessel containing water of measured quantity and temperature. From the rise in temperature of the water, and the specific heat of the metal ball, the temperature of the furnace can be deducted.

Discrepancies formerly observed between the results obtained with water calorimeters and other forms of pyrometers were due to taking incorrect values for the specific heat of iron at high temperatures. Those generally adopted are Plonchon's, based on Violle's melting point of silver, 907 degrees C. This is too low, 962 degrees C. being now generally accepted.

#### Fusion Thermometer.

Reference must be made to the excellent work of Seger in producing a series of porcelain cones melting at various temperatures, and to the work of Henry Watkin in the same direction. In an ingenious device, invented by E. H. Griffiths and W. C. D. Whetham, an iron rod is held rigidly in a steel tube by an alloy melting at any given temperature. The rod is free to rotate as soon as the alloy is melted, and can be made to ring an alarm either mechanically or electrically, or to shut off gas, steam, &c. By a simple contrivance it can easily be reset for another experiment.

The writer feels that he has only touched on the fringe of thermometry and its many applications. The number of these applications must increase as the demand for scientific accuracy increases in all our large industries.

**Lake Superior Commerce.**—The commerce through the canals at Sault Ste. Marie, Mich., and Ontario, Canada, in the navigation season of 1906 aggregated 51,751,080 net tons, an increase of approximately 7,500,000 tons over the preceding season, and of nearly 20,000,000 tons over that of 1904. The United States canal cared for 45,180,292 tons, and the canal in Canadian territory for 6,570,788. While of the entire movement, 41,584,905 tons moved in an easterly and 10,166,175 in a westerly direction. The principal items in the former movement were 138,607,764 bushels of grain, 6,484,754 barrels of flour, and 35,357,042 net tons of iron ore, while of the latter, 8,739,630 net tons of coal and 984,265 net tons of general merchandise composed the bulk of the tonnage. As compared with like shipments in 1905, grain gained over 30,000,000 bushels, flour more than 700,000 barrels, iron ore approximately 4,000,000 tons, and coal over 2,000,000 tons.

At Sausalito, Cal., on the summit of the high hill on which the city is built, a salt water fire protection system has been installed. This consists of a pumping station and a 30,000-gal. reservoir tank. The water is delivered to the reservoir through a 4-in. pipe from the pumping plant, located on the shore of the bay, and from the reservoir mains lead to numerous hydrants on the hill terraces.



### Customs Litigation Now Pending.

Appeals pending in customs cases affecting the classification of metal imports demonstrate that, although the Dingley law is in its tenth year, many points of tariff construction still remain undecided. At the present time the volume of metal litigation before the lowest customs tribunal, the Board of United States General Appraisers, is light, the most important question now pending being the classification to be accorded zinc ore. The chief litigation now rests between the Federal Circuit courts and the Circuit Courts of Appeals, the bulk, however, of the protest cases being in the courts at New York.

In the Circuit Court for the Eastern District of Pennsylvania the William Cramp & Sons Ship & Engine Building Company is seeking lower duties on so-called alloys composed of manganese, iron and tin and of copper and tin. They were classified in part under paragraph 172, relating to alloy composed in chief value of aluminum, and in part under paragraph 193, as articles composed of metal, not specially provided for. When the issue was before the Board of Appraisers the alloys were held dutiable under the provision relating to unwrought metals and metallic mineral substances, but the tribunal overruled the importers' contention because that claim was not made. The Cramp Company now maintains in the Circuit Court that the alloys are properly dutiable, either directly or by similitude as ferromanganese, ferrosilicon, &c.

The Government and the Crucible Steel Company are engaged in a controversy in the Appellate Court at New York to determine the rates applicable to sheet steel in strips. In the lower court the Government was defeated in its contention, the court holding that cold rolled steel strips, the only polish on the surface of which is that incidentally acquired in the process of cold rolling, were not within the provision in the law, for such strips "polished by any process to such perfected surface finish or polish better than the grade of cold rolled, smoothed only." Under this interpretation of the law, extra duty is avoided on the strips.

The Westinghouse Electric & Mfg. Company appears in the Circuit Court for the Western District of Pennsylvania as plaintiff in an action looking to lower duty on mica plate, classification being sought either as a partly manufactured article under Section 8 of the Tariff act or under paragraph 97 as a mineral substance not decorated. The Board of Appraisers found against the contention of the importers, it being held that the mica plate, composed of small sheets of mica pasted together to make larger sheets, is properly assessable as mica cut or trimmed at 12 cents per pound and 20 per cent. ad valorem.

A dispute dealing with the classification to be given steel floor plates is being threshed out in the Circuit Court at Philadelphia. The Government insists that the plates are dutiable under the provision for boiler or other plate iron or steel, whereas the importers, who were sustained by the Board of Appraisers, claim assessment as "steel plates not specially provided for."

Steel plates for engravers' use figure in an appeal filed in the New York Circuit Court. The plates, which have a polished surface and beveled edges, were deemed dutiable by the Collector of Customs under the provisions of paragraphs 135 and 141, providing, respectively, for steel plates and for an additional duty on steel having a polish better than the grade of cold rolled, smoothed only. The importers had contended that the articles were properly dutiable under paragraph 135, but the protest was regarded by the lower tribunal as insufficient. This defect will, it is expected, be remedied in the court.

Many importers are interested in a suit begun in the courts to determine the classification of nickel coated wire, an article produced by forcing an iron or steel wire core into a nickel tube, and then drawing it down to the requisite size. It was classified as wire not specially provided for, and is claimed dutiable under the provision for wire coated with metal, or the further provision of a duty of 1 per cent. per pound in addition to that imposed on the wire from which it is made.

The question of the classification under the Tariff act of steel wool, which has been in the courts before, is again pending in the Circuit Court in the shape of a new case standing in the name of the Buehne Steel Wool Company, the importer having been upheld by the Board of Appraisers in the contention that the article is dutiable as forms and shapes of steel. The Government alleges the product dutiable at 45 per cent. as a manufacture of steel.

Steel grinding plates, held by the Board of Appraisers to be dutiable as steel plates, are claimed by the Government to be assessable as manufactures of metal. This suit is in the Circuit Court on appeal by the Government, the importers being Thomas Prosser & Son.

George Nash & Co. have asked the Circuit Court for relief from a judgment rendered by the Board of Appraisers classifying screw rods as cold drawn and subject to the duty provided in paragraph 136 for wire screw rods, and to the additional duty provided in paragraph 141 for iron rods of whatever shape or section which are cold drawn. The importers contend that the board erred in finding the rods to be cold drawn, and, even though they were cold drawn, in holding that paragraph 141 applied to wire rods.

Another test suit brought by the Government relates to steel tubes or cylinders consisting of bottle shaped vessels about 4 ft. long and 8 in. in diameter, used for transporting carbonic acid gas at a very high pressure. The importer, the Liquid Carbonic Company, was taxed 45 per cent. on the articles under the provision in the law for steel tubes. The United States desires a decision in the Circuit Court, holding the tubes to be dutiable as manufactures of metal.

Whether nickel anodes are dutiable as manufactures of metal or under the provision for nickel in pigs or sheets is likely to be decided by the Circuit Court in a suit instituted by Hermann Boker & Co. The board found against the claim of the importers for assessment as nickel in pigs.

Other customs controversies in the courts have reference to the classification to be accorded the following imports: Steam plow machinery, tin disks, card clothing, bronze statuary, forgings, drawplates and wortles, polished steel, steel stampings, glass-metal bottles, steel horseshoe calks, pins, steel ball bearings, models of inventions, hematite iron ore, emery grains, wire rat traps and retort settings.

The calendar of the Supreme Court of the United States contains no customs appeals having to do with metals imports. It is believed that before the present year closes many of the issues pending in the courts will have been decided. This applies particularly to the cases in the Circuit Court of Appeals, where much of the tariff litigation ends.

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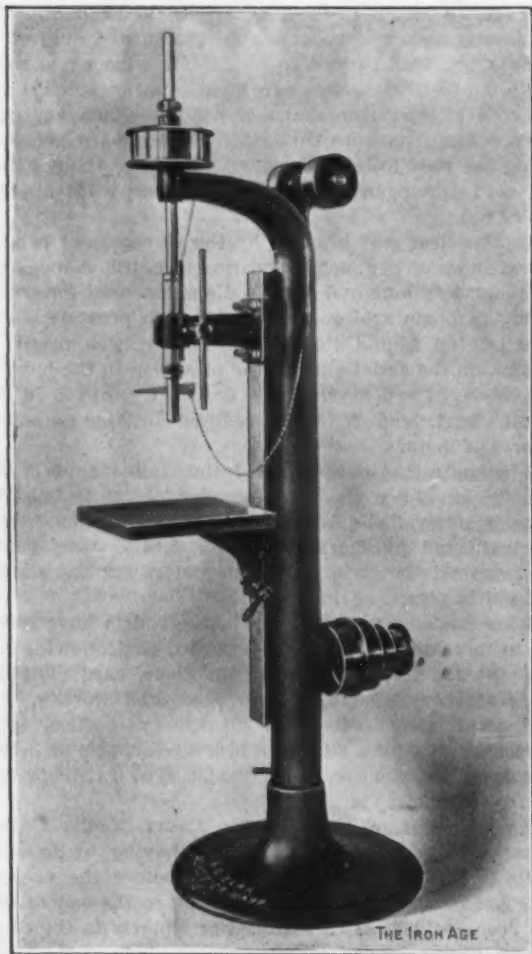
The National Supply Company, Toledo, Ohio, a West Virginia corporation which manufactures oil well and plumbers' supplies, has increased its capital stock from \$2,000,000 to \$4,000,000 by the addition of \$2,000,000 8 per cent noncumulative preferred stock, and will distribute the latter as a 100 per cent. stock dividend for the purpose of dividing a portion of the accumulated surplus, provided the shareholders at their meeting on February 13 approve. E. C. Converse and Arthur F. Luke are members of the committee having the matter in charge. The president, William Hardee, says that with the \$4,000,000 capital there will still be a surplus of more than \$300,000. The present capital outstanding is \$1,670,000, and dividends of 8 to 10 per cent. a year have been paid.

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The 60,000-volt transmission line, which the Edison Electric Company of Los Angeles, Cal., has been erecting, is now practically finished. It runs along the Kern River, a distance of 125 miles from Los Angeles, where it is connected with a 25,000-hp. hydro-electric station. The line consists of six cables carried on steel towers from 30 to 75 ft. high, and furnished with insulators, each about 3 ft. high and weighing 50 lb.

### The Barr No. 5 Single Spindle Drill.

The single spindle upright drill shown in the illustration is designed for use with high speed steel drills and is very powerful for its size. It is known as the No. 5 drill, and in general respects resembles the No. 1 drill built by its maker, H. G. Barr, Worcester, Mass., but it is intended for the heaviest work that can be accomplished by a sensitive drill. In practical every day work it will drill holes up to  $\frac{3}{4}$ -in., and under practical test, using a high speed drill of that size, it has drilled at the rate of more than 8 in. a minute, without damaging the drill. This was at a spindle speed of only 460 rev. per min. As the machine can be run at much higher



The No. 5 Sensitive Drill, Built by H. G. Barr, Worcester, Mass.

speed, average practice being approximately 700 rev. per min., the actual maximum drilling speed is probably a good deal higher than the 8 in. per minute of the test.

The drill has a 1-in. spindle with No. 2 Morse taper, and the customary ball bearing thrust collar. It has a vertical feeding movement of 5 in. and both the spindle and table brackets are adjustable vertically on the column to suit the size or shape of the work. The machine will drill to the center of a 16-in. circle and its net weight is 360 lb. The drive is through a 2-in. belt from a three-step cone pulley at the base of the column, over idlers to a 7-in. driving pulley on the spindle.

High pressure steam tests of an injector, carried out in England, show that, with feed water at 65 degrees, the maximum amount of water delivered per pound of steam was at a pressure of about 15 lb. per square inch, when the delivery was 29.7 lb. The results were pretty constant for pressures from 10 to 20 lb., after which the falling off was quite rapid. At 30 lb. pressure the delivery was 26 lb., at 50 lb. it was 19.8 lb., at 75 lb. it was 17.3 lb., at 100 lb., 15.3 lb.; at 200 lb., 10.7 lb.; at 300 lb. it was 6.8 lb. per pound of steam used.

### The Teas Lathe Driver.

In turning the tires of locomotive driving wheels while mounted upon their axles it is usual to mount the axle, with its wheels, on the centers of a double head driving wheel lathe, and to transmit the turning effort through some sort of stud projecting from the face plates between the spokes of the driving wheels. Generally the aim is merely to effect a forward rotation of the wheel.

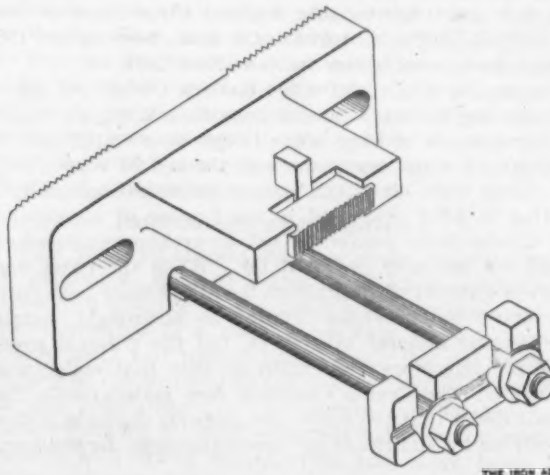


Fig. 1.—The Teas Lathe Driver for Securing Locomotive Driving Wheels to the Lathe Face Plates.

Sometimes the drivers are made to straddle the spokes and somewhat prevent jumping of the wheel when soft or low spots are encountered by the tool. Driving wheel tires as now often employed are rather hard, and the desire is to turn them quickly with heavy cuts and rather coarse feeds. The strains resulting from the action of the tools are transmitted radially to the rather delicate lathe centers on which the work is supported. The lateral strains due to the action of the tool have a tendency to spring the wheels and the axles, as well as to impose additional strains upon the lathe centers.

The lathe driver herewith illustrated, invented by Daniel H. Teas, is made and used by the Niles-Bement-Pond Company, 111 Broadway, New York City, in connection with the large double head driving wheel lathes it manufactures. The purpose of the device is to accomplish the heavy work of turning very accurately, rapidly,

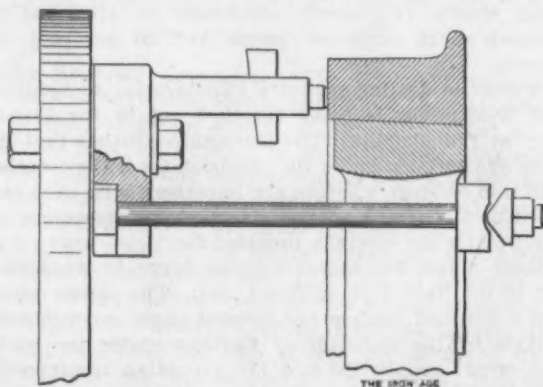


Fig. 2.—Detail Showing One of the Drivers in Use.

without excessive strain upon the lathe centers or wheels or axle. Fig. 1 is a perspective sketch of the device by itself, and Fig. 2 shows the device in operation, this being a vertical elevation, partly in section, of a part of one face plate and one driving wheel. Two or four of the drivers are usually employed for each wheel, these being placed in diametrically opposed pairs.

The face plate is of the ordinary type and the driving wheels are mounted in the lathe in the usual way, the axle being supported on the lathe centers. The base plate of each device is bolted to the face plate at a distance from its center approximately equal to the radius



of the wheel, and its rear face is serrated, so as to decrease the tendency to slip on the face plate. An arm projecting from this flange toward and fairly close to the outer edge of the tire, has a recess in its outer end to receive a block of hard steel, free to slide in a direction perpendicular to the face plate. This block also has a serrated edge intended to give it a good grip upon the tire of the driving wheel. To force the block against the tire of the wheel a wedge is driven behind it, as shown in the illustration, and the reaction to this force is provided by two bolts and a clamping yoke, which engage the inner face of one of the spokes of the driving wheel.

In use this driver is first firmly secured to the face plate in proper radial position and the key or wedge is withdrawn and the clamp bar removed. The pair of wheels on their axle are then mounted in the lathe upon the centers, and adjusted until the spokes are in proper relation to the clamping studs. The wedge is then adjusted to force the face of the sliding block firmly against the tire without laterally springing the work, and the

is given in Fig. 3, from which it will be seen that there have been some slight modifications made in the construction from that represented in the line drawings, Figs. 1 and 2. The projecting arm is made the full width of the base plate, one instead of two clamping bolts, is used, and the clamping yoke straddles two instead of one spoke. The principle, however, remains the same. Incidentally this engraving, Fig. 3, shows a rear view of the Niles 90-in. extra heavy driving wheel lathe, which was described in *The Iron Age* August 24, 1905. It may be interesting to repeat the principal dimensions. The distance between the face plate is 6 ft. 8 in.; the swing over the bed, 92 in.; diameter of the face plate, 90 in.; diameter of the work admitted, 60 to 84 in.; length of bed, 22 ft., 8 in.; greatest width of bed, 100 in. The main drive is from a 40-hp. Westinghouse motor, not shown. A small 5-hp. motor, the one shown in the engraving herewith, is used for quick traverse of the tailstock, or more exactly the movable head, as the tailstock in this case, like the headstock, is a driving agent. The article

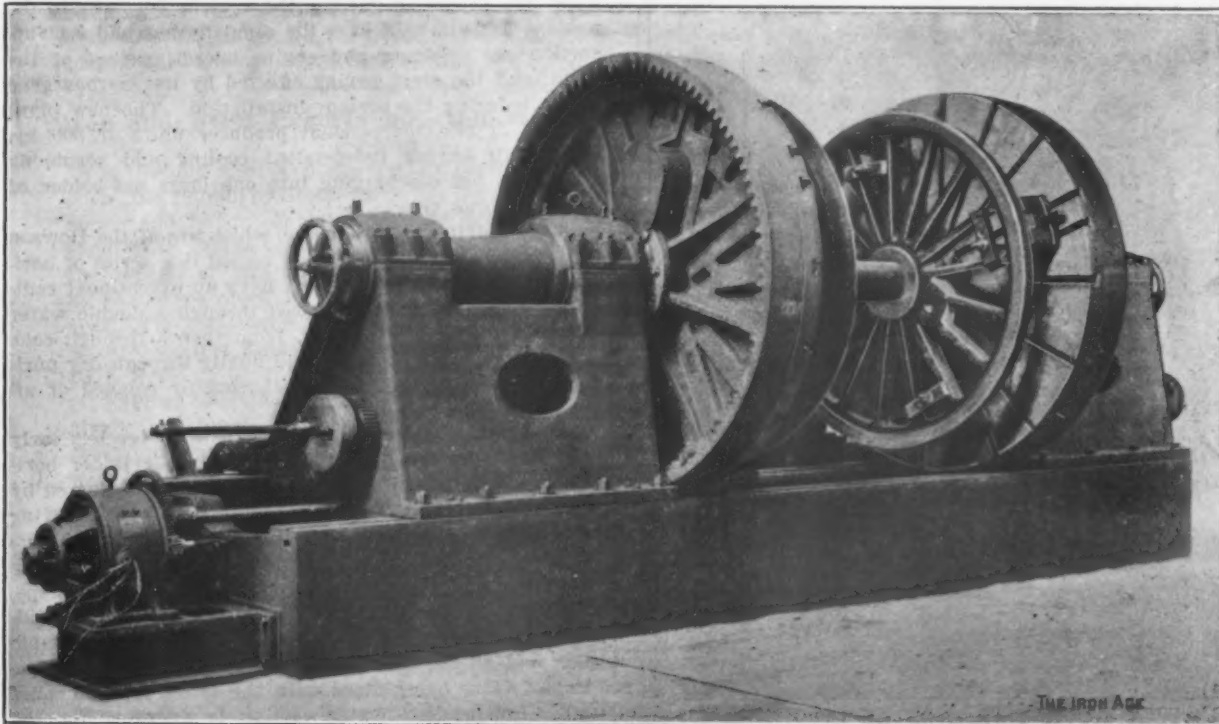


Fig. 3.—A Niles 90-in. Driving Wheel Lathe with a Pair of Wheels Secured with Teas Drivers.

clamp bar and its nuts are screwed up so as to clamp the wheel solidly between the clamp bar and the block. Sometimes it is preferable to adjust the clamp bar first, and then apply the heavier strain by driving the key in to force the block against the tire. The bolt holes in the flange of the base plate of the device are slotted to permit adjusting the driver to suit the position of the spoke of the wheel, and the clamp bar is also slotted so that it may be removed without removing the nuts from the studs.

When the work is mounted in the lathe in the manner indicated and the wheels clamped by these drivers, it becomes rigidly connected with the face plate without straining the wheel or axle, or bringing strains upon the lathe centers, and the strains due to the action of the tools will be imposed upon the face plate, instead of upon the lathe centers and axles. The device gives the wheel a support that is quite independent of the spokes. The block which it carries being of hardened steel its teeth may be forced into the metal of the tire, for even the hardest tires employed in practice are not sufficiently hard to resist the penetration of these teeth. Thus a driving grip is secured on the outer face of the tire. It has been found that with these drivers sufficient holding power has been obtained to take the heaviest cuts from the tires and at speeds conforming with present ideas in high speed lathe work.

An illustration of the Teas lathe driver in actual use

entitled "Remarkable Tire Turning," in *The Iron Age* February 8, 1906, recounted some notable work on one of these tools in the New York Central Railroad Company's West Albany shops. The Teas lathe drivers were used in these tests.

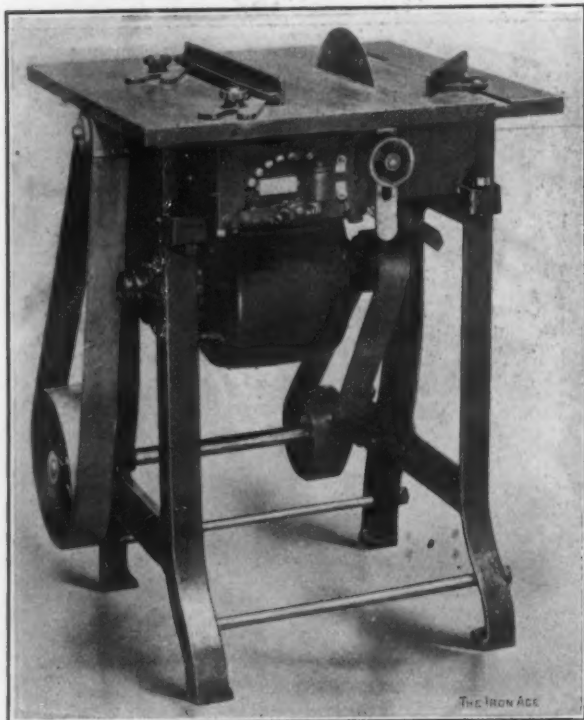
An interesting transporter bridge has been built over the River Usk, at Newport, England. In design it is an ordinary suspension bridge, but to allow the passing of ships beneath, the river banks being low, the bridge is 140 ft. above the water. A line of rails is laid on both sides of the web of the bottom beam of each girder, and on these a truck 104 ft. long is operated. Suspended from this truck by 30 steel cables, crossed to prevent lateral or longitudinal swaying, is carried a car 33 by 40 ft., this car being at the level of the river banks. The car, which weighs 51 tons, is designed to carry a live load of 66 tons, making a total of 117 tons. The truck at the top is operated by electric motors controlled from the lower car. The total cost of the construction is said to have been about \$350,000.

The estimates of the Prussian State railroads for the fiscal year 1907 call for 234,100 metric tons of rails at an average cost of 117 marks per ton; for 95,100 tons of track fastenings at 174.04 marks, and 129,700 tons of iron ties at 109 marks. The total length of the railroads under State administration is 35,869 kilometers.

### A New Acme Metal Saw Table.

A new motor driven circular saw machine particularly adaptable for accurately cutting sheet brass and copper, brass and copper tubes and rods, fibre, commutator bars, and like materials, known as the Acme metal saw table No. 2, is now built by the Hub Machine & Tool Company, Philadelphia. This machine is larger throughout than the old type saw table which has been on the market for some time, and is made either for belt drive from a line shaft or with contained motor drive. On the machine illustrated a 1-hp. Westinghouse direct connected motor provides the drive, the starting box being conveniently located on the front of the machine, as shown.

The table top, which swings entirely open, being hinged at the back, is 22 x 24 in. in size. The slitting gauge is adjustable so as to take work up to 12 in. wide, and the cross gauge will swing from 90 degrees either way to practically any angle. The various adjustments



The Acme Metal Saw Table No. 2, Manufactured by the Hub Machine & Tool Company, Philadelphia.

can be made to 1-1000 in. Saws up to 10 in. in diameter are used on this machine, attaining a speed of 1500 rev. per min. The center of the saw mandrel is only 1 in. below the surface of the table, thus allowing the use of saw blades of small diameter. The saws may be adjusted to various heights, while a patent holder is provided for removing and replacing them on the arbor. This machine is built wholly of metal and is entirely self-contained. The direct connected machine weighs complete 450 lb.

### Chicago Trade Interests Seek New Headquarters.

Coincident with the completion of the Commercial National Bank's new office building, corner of Clark and Adams streets, Chicago, now in course of construction, and which will be ready for occupancy, in part at least, by April, there will be a removal thither from the present office quarters of a large number of railroads, iron and steel corporations and allied manufacturing interests. A list of some of the more important interests that have already secured space and will move into this building on or before May 1, is as follows: Atchison, Topeka & Santa Fé; Chicago, Burlington & Quincy; Colorado Midland; Elgin, Joliet & Eastern; El Paso & Southwestern; Illinois Central; Lehigh Valley; New York, Chicago & St. Louis; Pittsburgh, Cincinnati, Chicago & St. Louis and Wabash railroads; American Sheet & Tin Plate Company; American Steel & Wire Company; American Steel Foundries; American Bridge Company; Illinois

Steel Company; Carnegie Steel Company; National Tube Company; Standard Oil Company; Shelby Steel Tube Company; Pickands, Brown & Co.; Green Engineering Company; Niles-Bement-Pond Company; American Refractories Company; Continental Can Company; Expanded Metal Fireproofing Company; National Fireproofing Company; Chicago, New York & Boston Refrigerator Company; Morden From & Crossing Works; Universal Adding Machine Company; Illinois Improvement & Ballast Company; Wabash Screen Door Company; J. A. Fay & Egan Company; Chalmer & Williams, and Theo. Geissmann.

### The Simonds Canada Saw Works.

The largest industrial producer gas plant in Canada is being erected at the works of the Simonds Canada Saw Company, Ltd., St. Remi, Montreal, says the *Engineering Journal of Canada*. This plant is of 600 hp. capacity, and is to be used both for driving gas engines and providing gas for the various furnaces in the works. For almost a year the company has had a 50-hp. suction gas producer and engine operating part of the plant, and the great saving effected by its use has gone far in inducing the present installation. The new plant consists of two independent producer units of 300 hp. each, both having independent cooling and scrubbing apparatus, but discharging into one large gas-holder of the gas works type.

After leaving the producers, which are of the Dowson type, the gas is first thoroughly cooled in a series of horizontal cast iron coolers, which have an exceptional radiating surface; it is then passed through a double water sealed box of special design, from thence through coke scrubbers of large capacity, and finally through dry purifiers, the gas in this manner thoroughly cleaned of all tar, dust, and other impurities.

The first of the large engines will be erected early this year, and will be a four-cycle single cylinder horizontal unit of 150 hp. This engine is what is classed by English builders as "special electric light type," having an extended crank shaft with outer bearing, and only one fly wheel of extra large diameter, weighing 10 tons. The crank shaft bearings are of the continuous oiling type, similar bearings being also provided for the secondary shaft. The cylinder is provided with a removable liner, and all the valves are seated into loose boxes, the exhaust valve being fitted with the latest type of relief gear. Independent water cooling is provided for the cylinder, piston, cylinder head, exhaust valve and exhaust valve seat. In this manner premature ignition due to overheating of the parts named is eliminated. Ignition is effected by a powerful magnetic machine. The operator is provided with means of independently controlling the amount of air or gas, the time and intensity of the spark, and the engine speed. The engine is started quietly and easily by means of compressed air, one man only being required.

The plant is being supplied by the Producer Gas Company, 11 Front street East, Toronto, and is of British manufacture, but in future the producer plants will be of Canadian manufacture, built to the Producer Gas Company's own designs.

**The Crane Company's Annual Gift.**—The close of 1906 rounded another successful year for the Crane Company, Chicago, and, following a custom adopted in 1900, the company generously shared the fruits of this success with its employees. On a basis of 10 per cent. of the earnings of employees for the year, there was distributed as a Christmas present, in round numbers, \$330,000. This was \$25,000 more than the distribution of 1905, and makes a total of \$1,500,000 thus distributed to date. Every employee, irrespective of his position or length of service, received 10 per cent. of his year's earnings in a lump sum, accompanied by a card bearing the good wishes of the company and a bit of wholesome advice as to the wisdom of preparing for the inevitable "rainy day." Six thousand employees were beneficiaries of the latest gift of the Crane Company.



### Canadian Pig Iron Production in 1906.

The American Iron and Steel Association's statistics just published show that the total production of pig iron in Canada in 1906 amounted to 541,957 gross tons, against 468,003 tons in 1905, an increase of 73,954 tons or over 15 per cent. Of the total production in 1906, 525,716 tons was made with coke, 16,021 tons with charcoal, and 220 tons with electricity. The production of basic pig iron in Canada in 1906 amounted to 246,228 tons, against 172,102 tons in 1905, and the production of Bessemer pig iron was 165,609 tons, against 149,203 tons in 1905. Basic pig iron was made in 1906 by three companies owning six furnaces and Bessemer pig iron by two companies owning three coke furnaces. The basic and Bessemer pig iron was all made with coke. Canada has not made spiegeleisen or ferro manganese since 1890.

On December 31, 1906, Canada had 15 completed blast furnaces, of which eight were in blast and 7 were idle. Of the total 12 usually use coke for fuel and three use charcoal. In addition one furnace to use coke was building, and three coke furnaces were partly erected on December 31. Work on the partly erected furnaces was suspended, however, some time ago.

### Iron and Steel Exports and Imports in 1906.

In issuing the December report of imports and exports, the Bureau of Statistics of the Department of Commerce and Labor enables aggregate figures for the calendar year 1906 to be completed. These figures show that the exports of iron and steel and manufactures thereof in 1906 were much in excess of those of any previous year. The total value, not including iron ore, was \$172,555,588, against \$142,930,513 in 1905 and \$128,553,613 in 1904.

Taking the commodities for which quantities are given, it is found that the total for 1906 was 1,325,157 gross tons, against 1,010,255 tons in 1905. Never before was the quantity total for 1906 closely approached. It is of particular interest in this connection to give the yearly totals of quantity exports extending back to the time when our exports of iron and steel began to be of some importance. In the following table the figures are given for each calendar year from 1897 to the present time:

Year.	Gross tons.	Year.	Gross tons.
1897.....	157,834	1902.....	370,805
1898.....	144,595	1903.....	326,590
1899.....	942,689	1904.....	1,167,674
1900.....	1,154,284	1905.....	1,010,255
1901.....	700,857	1906.....	1,325,157

The quantity figures for December show some falling off as compared with those for November. The quantity exported in December was 99,875 gross tons, against 116,675 tons in November, 104,626 tons in October, 89,319 tons in September, 111,260 tons in August and 98,409 tons in July. The following table gives the exports for December, and for the 12 months ending with December in 1906 and 1905:

Commodities.	December.		Twelve months.	
	1906.	1905.	1906.	1905.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	8,265	3,442	83,317	49,221
Scrap .....	1,140	751	11,742	7,966
Bar iron.....	4,765	2,738	56,024	32,025
Wire rods.....	46	719	5,894	6,514
Steel bars.....	2,761	750	31,631	19,845
Billets, ingots, blooms...	6,137	34,606	192,616	237,738
Hoop, band, scroll...	1,036	604	5,405	4,431
Steel rails.....	31,157	21,717	328,036	295,023
Iron sheets and plates	1,613	801	16,964	8,004
Steel sheets and plates	6,165	5,789	93,601	67,093
Tin plates andterne plates .....	580	443	12,082	7,941
Structural iron and steel .....	9,878	10,765	112,555	84,234
Wire .....	13,192	12,942	174,014	142,609
Cut nails.....	456	394	7,568	7,890
Wire nails.....	2,193	2,564	46,237	35,702
All other nails, including tacks.....	782	257	5,687	4,019
Pipes and fittings*	9,709	12,651	141,784	....
Totals.....	99,875	111,933	1,325,157	1,010,255

\* Quantity not stated prior to July 1, 1905.

The total value of imports of iron and steel and manufactures thereof, not including iron ore, in the calendar year 1906, was \$34,827,132, against \$26,401,283 in 1905 and \$21,621,970 in 1904. Taking the commodities for which quantities are given, the aggregate imports in 1906 were 584,419 gross tons, against 416,000 tons in 1905. The imports in December showed a heavy gain on November. The December imports were 93,200 tons, as compared with 61,370 tons in November, 51,715 tons in October, 39,679 tons in September, 34,112 tons in August and 52,715 tons in July. The imports of such commodities for December and for the 12 months ending with December in 1906 and 1905 were as follows:

Commodities.	December.		Twelve months.	
	1906.	1905.	1906.	1905.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	74,412	26,576	379,828	212,466
Scrap .....	712	7,991	19,091	23,731
Bar iron.....	4,335	3,147	35,793	37,294
Rails .....	288	574	4,943	17,278
Hoop, band and scroll	32	1,965	10,231	4,772
Billets, &c., steel in forms n.e.s.....	2,198	1,900	21,337	14,642
Sheets and plates...	176	221	3,231	2,336
Tin plates andterne plates .....	8,043	3,308	56,983	65,740
Wire rods.....	1,530	1,562	17,799	17,616
Wire and articles made from .....	773	402	6,610	3,978
Structural iron and steel .....	701	3,595	28,573	16,147
Totals.....	93,200	51,241	584,419	416,000

The quantity of iron ore exported in 1906 was 265,240 gross tons, against 208,017 tons in 1905. The imports of iron ore in 1906 were 1,060,390 gross tons, against 845,651 tons in 1905.

### The Tower Hill-Connellsville Coke Company.

This company organized by capitalists of Uniontown, Pa., has purchased 2000 acres of coal land in Luzerne and Redstone townships for \$3,400,000, which it will immediately develop. On this property the company will erect 1000 coke ovens of modern design, which will be constructed so that the coke can be drawn by machines. Of this number 800 will be built at once, and 200 more added as soon as the coal is developed sufficiently to supply the ovens. Contracts are being let for the development of the property, and it intends to begin sinking the shafts by March 1, which will probably enable it to reach coal and begin to produce coke by fall. The property adjoins the plants of the Orient, Republic and Thompson-Connellsville Coke companies and is provided with excellent shipping facilities, being located on the Pennsylvania, Pittsburgh & Lake Erie and Baltimore & Ohio railroads. The company, which was recently organized, has a capital stock of \$5,500,000, divided into \$1,500,000 preferred and \$4,000,000 common stock. In addition bonds to the amount of \$2,500,000 will be issued.

The president is George D. Howell, Uniontown, who is vice-president of the McCrum-Howell Company and a director in the Rich Hill Coke Company; first vice-president, F. M. Osborne, Cleveland, Ohio, president of the Youghiogheny & Ohio Coke Company and formerly president of the Pittsburgh Coal Company as well as director in the First National Bank and the Guardian Savings & Trust Company; second vice-president, J. V. Thompson, president of the First National Bank of Uniontown and vice-president of the Thompson-Connellsville Coke Company; secretary and general manager, L. W. Fogg, Uniontown, formerly general manager of the Brier Hill Coke Company and also of the coke interests of the Republic Iron & Steel Company; treasurer, Joseph R. Nutt, Cleveland, Ohio, secretary and assistant treasurer of the Citizens' Savings & Trust Company, treasurer of the Northern Ohio Traction Company and a director of the Uniontown National Bank and the Quaker Oats Company; assistant treasurer, John R. Thompson. Besides the officers the Board of Directors includes Andrew Squire, Cleveland, Ohio; George H. Burr, New York, and Lloyd G. McCrum, New York, president of the McCrum-Howell Company and a director of the Thompson-Connellsville Coke Company.

# THE IRON AGE

1855-1907.

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## The Iron Age Index.

The index to the reading matter of Volume 78 of *The Iron Age*, for July 1 to December 30, 1906, has been compiled and printed and will be mailed to those subscribers of *The Iron Age* who will make application for it.

To relieve those who bind or file *The Iron Age* of the trouble of future applications for the semiannual index we have a special list of addresses to which the index is forwarded without further notice. Subscribers who desire their addresses entered upon that list will kindly so advise us.

## Pig Iron Increase for 1906 Goes to Steel.

The feature of the pig iron statistics for 1906 which calls for comment is that all the increase in production over 1905 was contributed by steel making irons. Not only so, but while the total production of 1906 was 10 per cent. greater than that of 1905, Bessemer and basic irons actually made up besides for a falling off in foundry and forge irons. Attention has been called from time to time in connection with our monthly blast furnace statistics to the fact that foundry iron furnaces have been barely holding their own and that the steel company furnaces and the merchant furnaces whose product is sold to steel companies have been making the increases, though with much strain and with many breaks in their ranks for long postponed repairs. Nevertheless, there will be some surprise at the showing made by the figures below, namely, that with all the demands expanding business made upon the foundries of the country, they were able to get even less iron from domestic furnaces in 1906 than in 1905—this statement assuming that practically as much forge iron was made in 1906 as in 1905, or 727,817 tons. The figures of last year compare with those of the two preceding years as follows:

Production of Various Kinds of Pig Iron.—Gross Tons.				
	1904.	1905.	1906.	Incr. 1906 over 1905.
Bessemer .....	9,098,659	12,407,116	13,840,518	1,433,402
Basic .....	2,483,104	4,105,179	5,018,674	913,495
Foundry and forge...	4,694,878	6,188,100	6,147,499	*38,610
Ferro and spiegel...	220,392	293,976	300,500	6,524
Totals .....	16,497,033	22,992,380	25,307,191	2,314,811

\* Decrease.

While some small tonnage of standard Bessemer iron may go to malleable foundries—small as compared with the total of "malleable Bessemer," which is not classed under Bessemer—and while ingot mold foundries also consume a small percentage of the Bessemer output, the table shows how remarkably the steel works furnaces and the larger merchant stacks responded to the demand upon them last year. It gives, in fact, a basis for approximating the steel production of 1906, the official figures for which are not yet made up. Taking the relation between Bessemer and basic pig iron outputs in recent years and those of Bessemer and open hearth steel, and

applying it to the pig iron figures for last year, we reach an estimate of 12,200,000 tons of Bessemer ingots and castings in 1906 and 10,600,000 tons of open hearth ingots and castings, as against 10,941,375 tons and 8,971,376 tons, respectively, in 1905. Adding crucible steel, the total of steel ingots and castings in 1906 will probably be not far from 23,000,000 tons. It is entirely within reason to expect to find Bessemer steel and open hearth steel production on a parity within the next two years.

Another interesting feature of the pig iron returns is the relative standing of the various sections and States. Those of the Southern States which send pig iron to market—namely, Alabama, Tennessee, Georgia, Texas, Kentucky, North Carolina and Virginia—produced 2,775,973 tons last year, or 11 per cent. of the whole, as against 2,589,398 tons in 1905, or 11.2 per cent. of the whole. In 1904 these States made 13.2 per cent. of the total for the country, and that was exactly their percentage in 1901. While they have increased their total output the great steel making districts in the North have increased faster. The districts nearest the Lake Superior ore supply are conspicuous for growth in pig iron output. Due in large part to the expansion in the Buffalo District New York made a gain of 354,000 tons over 1905. Ohio gained 740,000 tons, Pennsylvania 668,000 tons, Illinois 122,000 tons and Michigan 80,000 tons. Alabama gained 70,000 tons, while Virginia alone of all the States showed a falling off. The most marked increase in the next few years will doubtless be in Indiana, which from being a nonproducing State will eventually become a strong competitor of Illinois.

## Co-operation Among Engineering Schools.

The growing disposition of engineering institutions of the country to co-operate by offering an interchange of facilities for investigation and research is already proving of great mutual advantage. The privilege of using one another's laboratory equipment allows each to specialize in its equipment, and is bringing nearer the day when the schools, as a whole, will have everything required for the most painstaking and exact investigation and experiment.

Each engineering school needs more than the apparatus necessary in the training of its undergraduates if its professors and instructors are to have the opportunity of continuing their studies, and the postgraduate students are to be enabled to carry forward their special research work. A few of the larger technical and scientific schools possess such extensively equipped laboratories that they would at first seem to be independent of other institutions, but this is not the case. Many smaller schools have men who have specialized along certain lines, perfected apparatus and procured results, until each has created a center for his branch of work. If he will permit his records and laboratories to be used by others pursuing the same line of study it will obviously augment the accumulation of scientific knowledge.

It is an ethical trend that extends as more realize the common benefit resulting, and one frequently hears of a student from one engineering school being invited to continue his work at another. This extension of privileges has always existed more or less. Probably instances where it was denied because of rivalry are very few. The reason it was not more common in the past was rather that it was not the custom. Now it has come to be an everyday occurrence, and the future promises an extension of the practice, until the engineering schools by co-operating shall constitute a sort of gigantic university.



**Mercantile and Manufacturing Wages.**

The Massachusetts Bureau of Labor and Statistics has compiled an analysis of the wages paid in the various classes of mercantile employment of the State, which permits an interesting comparison with wages paid in corresponding lines of manufacturing. Salaried employees are classified separately, so that this higher paid element may be eliminated in the consideration of the question. According to the figures the mercantile employments are better paid. But we believe that if the analysis could go still deeper it would show that the discrepancy is not very great. The general correction should be made that wages are surely 10 per cent. higher than when the Bureau secured its data in 1905, and probably in the comparison the manufacturing industry should be considered as having gained materially more than mercantile lines.

The following table shows the comparison between manufacturing and mercantile weekly wages in the machinery industry, compiled for the sake of securing an instance in which conditions are more or less familiar to many of our readers:

*Comparison of Weekly Wages in Machinery Lines.*

	Under \$5.	\$5 and under \$10.	\$10 and under \$15.	\$15 and under \$20.	\$20 and over.	Totals.
Mercantile . . . . .	8	35	66	45	41	195
Per cent. . . . .	4	18	34	23	21	....
Manufacturing. 1,539	12,353	12,813	6,811	1,688	35,204	
Per cent. . . . .	4	35	36	19	5	....

The differences noted are probably not so much because one class is paid better for a given degree of skill and usefulness, as it is because the percentage of skilled labor is greater in the one case than in the other. The mercantile house requires some expert men in its repair shop and warerooms. It is located in one of the larger cities, where wages range higher than in the smaller towns where many of the manufacturing establishments are situated. Similar comparisons in other branches of industry give considerably different percentages. The following table, working out the general comparison, indicates this, as would be expected, considering that textile and other low-waged industries are also included:

*Comparison of Weekly Wages in General Lines.*

Classification of weekly wage.	Manufactures.		Trade.	
	Number.	Percent-ages.	Number.	Percent-ages.
Under \$5. . . . .	49,270	9.55	16,195	12.54
\$5 but under \$6. . . . .	42,227	8.10	9,237	7.15
\$6 but under \$7. . . . .	54,944	10.65	12,440	9.63
\$7 but under \$8. . . . .	56,439	10.94	7,831	6.07
\$8 but under \$9. . . . .	49,566	9.61	7,843	6.07
\$9 but under \$10. . . . .	56,629	10.98	8,693	6.73
\$10 but under \$12. . . . .	64,145	12.43	17,645	13.67
\$12 but under \$15. . . . .	66,259	12.84	25,517	19.76
\$15 but under \$20. . . . .	56,879	11.03	16,875	13.07
\$20 and over. . . . .	19,475	3.78	6,853	5.31
Totals . . . . .	515,833	100.00	129,129	100.00

It will be seen that 9 per cent. of employees of manufacturers received less than \$5; 50 per cent. less than \$10; 25 per cent. less than \$15; 11 per cent. less than \$20, and 4 per cent. more than \$20. As to employees of mercantile establishments, 12 per cent. received less than \$5; 36 per cent. less than \$10; 33 per cent. less than \$15; 13 per cent. less than 20, and 5 per cent. more than \$20. These percentages are widely different from those of the machinery business taken by itself, and doubtless there is a large variation with various other branches of business.

Below is an interesting table showing the wages paid in some of the mercantile trades, as taken from the report of the Massachusetts Bureau:

*Classification of Weekly Wages in Certain Mercantile Lines.*

	Under \$5.	\$5 and under \$10.	\$10 and under \$15.	\$15 and under \$20.	\$20 and over.	Totals.
Artisans' tools. . . . .	9	7	13	2	4	35
Automobiles . . . . .	12	44	113	110	54	333
Bicycles, tricycles, &c. . . . .	13	32	41	9	....	95
Cutlery, sporting goods, &c. . . . .	13	16	11	8	8	56
Gas and electric fixtures and supplies . . . . .	28	92	86	123	26	355
Hardware . . . . .	149	646	645	462	157	2,059
Iron, steel and other metals . . . . .	12	127	197	55	30	421
Iron (scrap) and old metals . . . . .	9	42	39	7	1	98
Machinery (automatic) . . . . .	....	6	8	10	24	48
Machines . . . . .	8	35	66	45	41	195
Metallic goods. . . . .	1	32	26	33	11	103
Plumbers' and gas fitters' supplies . . . . .	5	84	113	72	64	338
Stoves, hardware, tinware, &c. . . . .	98	384	317	270	40	1,109

Wages were highest among those selling automatic machinery, 50 per cent. of the employees receiving \$20 or over per week. Next came sellers of machines, with 20 per cent. of the employees in the same class. Plumbers' and gas fitters' supplies showed 19 per cent. of this character of employees, while automobiles showed 16 per cent.; cutlery and sporting goods, 14 per cent.; artisans' tools, 11 per cent.; metallic goods, 10 per cent.; hardware, iron and steel and gas and electric fixtures, each 7 per cent.; stoves, tinware, &c., 4 per cent.

**Specializing in Apprenticeships.**

The beginning seems to have been made among the large machine shops of the country of fixing specialization upon the apprentice system. By this is meant eliminating the training of the all-round mechanic, and in his place rearing the highly expert lathe hand, or planer, milling machine, drill or grinder hand, or the fitter. The belief has begun to grow that there is no longer, as in the old days, the imperative need of the all-round man, and that the years of apprenticeship would be best spent in learning some one branch of the trade, and learning it well. The advocates of the change maintain that such a course would be better for the apprentice as well as for the man who is to employ the apprentice when he becomes a journeyman, and incidentally he would be more valuable as an element of production during his apprentice years.

This system is already carried on in many works, but without the indenture feature of apprenticeship. Boys are taken in and given work on some one class of machine until, if they keep at it, they become experts within certain limits. They are not apprentices, but workmen, who may stay or leave as they or their employers may choose. In this way great numbers of good workmen are produced, some of them developing into experts, on even terms with their associates who have had the general training of an apprentice course. The experience with boys trained in this manner has naturally developed the idea of the specialized apprentice, who would likewise be trained on some one class of work, but, of course, with the advantage of more liberal instruction and greater opportunities in the class of work performed.

A weakness in the system as proposed, pointed out in argument, is that the boys who are to act as foremen, as they ascend the industrial ladder, would be more valuable were they given the general training of the present apprentice system. This is undoubtedly true. There will

never be a time, at any rate not for years to come, when a certain number of all round men will not be needed, and in works where they are needed their training will continue to be part of the apprentice system. But the argument concerning the foremen of the future should be taken with some reservation. It may be presumed that the lathe hand, trained through an apprentice course and afterward as a journeyman, must have picked up a good general knowledge of machine shop practice, if he is the sort of man one would naturally expect to see promoted to be a foreman. And, again, it must be remembered that the practice is steadily growing of obviating to a large extent the necessity of precise technical knowledge on the part of the foreman, who in many establishments receives most explicit directions concerning the work his men are to do, even to the speeds and feeds of the tools which they will employ. The foreman's judgment becomes more and more a minor consideration, and his relations with his men become correspondingly different, though always important in an executive way.

Specialization in the apprentice system is not at all frequent as yet. It is usually confined to instances where a shop's product is such as to require the services of specialized workmen in operating the machinery manufactured, as, for instance, grinding machinery. One large builder of this class of machine has a special apprentice course in grinding. The tendency of modern manufacturing must always be toward centralizing the maximum of production into a given unit, be it machine or man, and in large works the highly specialized workman will always be in greatest demand. If in accomplishing the effort toward most efficient and economical production specialized apprentices are found to work out best results, that system will gain ground until it fills an important place. Enough works are taking up the system to promise eventually the opportunity for comparison.

### Industrial Welfare.

A relatively new subject has been taken up of late by the managements of manufacturing and other commercial enterprises. It is comprehensively called "Industrial Welfare," and may include one or all of the following: Protecting employees or patrons from danger by accident or disease, promoting their bodily comfort and mental content and encouraging study and thrift. Happily the larger concerns, which are best able to do so and are most likely to be imitated, are setting the example. As yet the ice is barely broken; the pioneers have opened up a field of wonderful possibilities, and the minor reforms are so easy to accomplish that it is to be earnestly desired that those on whom the responsibility rests will early become active in what is without doubt the most commendable movement of the century.

To our shame, our foreign brothers are far in advance of us, probably because American energy is first of all directed at material achievement, and in that ambition the ethical side has been overlooked. Until recently we had no definite nucleus for unified endeavor, and what has been accomplished is due to individual attempts. Now we have an organization the sole purpose of which is to better industrial conditions—the American Institute of Social Service—and it deserves the hearty support of all who can help make it effective.

Some of the facts brought to light by the Institute are evidence enough of the need of measures to reform present conditions. It is hard to believe, for example, that the number of people who were killed or died of wounds in the four years of the American Civil War

was some 80,000 less than are accidentally killed in four years in this country. In other words, the number who come to death in industrial occupations is 53 per cent. greater than the total number swept away in the same length of time by a great war. Both sides in the Crimean War together lost only half as many as are accidentally killed annually in the United States alone, and each year New York City reports 3500 fatalities caused by accidents. Assuming the same rate of deaths by accident and violence as was reported by the Government Census of 1900 for that year—57,513—there are killed every decade enough people to populate three good sized cities. And the number of maimed or seriously injured is nearly nine times greater. Many accidents are admittedly unavoidable, cannot be foreseen or guarded against, but the vast majority could be prevented. Societies abroad working along the same lines as the American Institute have shown that a large proportion of the industrial accidents are preventable, and it is estimated that three-fourths of our accidents could be avoided. This being so, it is high time that those in position to improve the situation should give these matters serious thought, and it is to be strongly urged that manufacturers and operators of public utilities interest themselves in the work of the Institute, both by inviting its suggestions for safeguarding the lives under their care and offering suggestions based on their own experience, which the society might pass along for the good of the country at large.

Just now the Institute is holding an International Exposition of Safety Devices and Industrial Hygiene, as reported in another part of this issue. This, as the name implies, has for its object the extending of knowledge concerning the means now available for protecting life, this being the most important phase of industrial welfare, but the other considerations embraced under that heading have their place in the ends the Institute aims to further. It is hoped that the exposition, which it is intended to hold periodically in a number of cities, may lead to the foundation of a permanent museum of security, such as is found in several European cities, and manufacturers or inventors of articles which would form appropriate exhibits are invited to contribute to its collection.

The regular meeting of the Pittsburgh Foundrymen's Association was held at the Carnegie Technical School Foundry building on Monday evening, February 4. The Carnegie Technical School, through the courtesy of C. B. Conley, head of schools of apprentices and journeymen, gave the use of the foundry building for an exhibit of molding machines, which were exhibited in the order named: The E. H. Mumford, the Tabor, the Herman and the Pridmore.

In the recent Scottish trials of touring motor cars the best performance on the basis of consumption of fuel was made by a 10-hp. Darracq car with a two-cylinder engine. The dimensions of the cylinder were 4-in. bore by 4½-in. stroke, and the weight of the car empty was 1850 lb. Laden, the weight was 2450 lb. The car averaged 41.7 ton-miles per gallon of gasoline consumed. The second best performance on the same basis was that of a 12-hp. Arrol-Johnston dogcart, with a horizontal engine having two cylinders 4½ x 6½ in. This car weighs, light, about 2400 lb., and laden, over 3000 lb. The fuel consumption was 1 gal. for 38.8 ton-miles.

The Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa., launched successfully January 29 the freight and passenger steamship Massachusetts, building for the New England Navigation Company. The vessel is 396 ft. long, and will have a freight carrying capacity of 1500 tons.



## San Francisco and Its Trade Rivals.

SAN FRANCISCO, CAL., JANUARY 28, 1907.—San Francisco merchants are much exercised over the attempts of Spokane to be recognized as a terminal point. This is not on account of Spokane particularly, for which they have the friendliest feelings, but because opportunity is being taken to try and abolish what have been known as postage stamp rates by which the cities on the Pacific seaboard have been allowed the benefit of sea competition in fixing railroad freights. The same question was raised some years ago, when the Interstate Commerce Commission gave a week to the examination of the merchants of San Francisco and the representatives of Chicago and St. Louis. Then the Southern Pacific, through J. C. Stubbs, declared that if the postage stamp rate was abolished it was not a remote possibility that the road would become bankrupt, as the merchants would import their goods by sea. The merchants of San Francisco testified that they had either to give up the business that had taken nearly 50 years to establish or they would have to give up the railroad altogether. And it is much the same now. If every growing city is to be made a terminal point, it is certain that the merchants of the coast cities, with San Francisco in the lead, will establish steamship lines between their cities and New York. A good deal of business is even now being done in this way by the Hawaiian-American Steamship Company. As in other cases, the representatives of the hardwaremen are taking a leading part in this contest.

Quite a number of orders are now being placed in the East for the steel for some of the new large buildings. The total orders closed for the present month have been in the neighborhood of 10,000 tons of structural shapes, the amounts in each case varying from 500 tons for the Sachs Building, to 1000 tons for the Magee Building. The Palace Hotel has at last been pulled down and is now a big pile of debris. The new building which will be erected on its site, and which will cost about \$3,500,000, though not having a steel frame will nevertheless contain much more steel than the old hostelry did.

The production of lumber increased greatly in this State the past year, and the present will follow in its footsteps. There will be no increase in the capacity of the redwood mills, but as in 1906 a good deal of new machinery will be put in—gangers, edgers, planers, &c.

The news from the Nevada gold fields continues uniformly good, but unwise speculation and labor strikes have made some trouble there. As it is, there is a constant demand for machinery for the more promising mines, and our foundries will be full of orders for the year. The Union Iron Works has had to ask an extension of time on its Government contracts, not being able to get enough workmen.

For the past two weeks or so the weather has been almost steadily rainy. The result has been that the outside work on buildings and improvements generally has had to be suspended, and not only that but transportation within the city has been much interfered with, some streets being so broken up that it takes twice as long to haul goods as it did before. The result has been a dullness in general business. The preparations for the continuance of work on new buildings and starting on others are on a vast scale, however, and the spring will see an activity here that has never before been equaled. Of course this is a result of the demands for reconstruction, but even without these the spring trade would have been a good one this year.

J. O. L.

Compressed air locomotives, which in the past few years have come into extensive use for mine haulage, work under pressures ranging from 500 to 2000 lb. per square inch. The pressure is determined mainly by the size of the locomotive permitted by the dimensions of the tunnels and curves. In tunnels of good size the large reservoirs required by low pressure engines are permissible, but where only small reservoirs can be used it is necessary in order to carry the supply of power required to compress the air to a higher degree in the steel tubes (bottles, as they are sometimes called), which are made of such a strength as to safely carry the pressure.

## Sauerbeck's Annual Review of Prices.

Among the most famous economists and students of the fluctuations in prices is A. Sauerbeck of London. His annual review, printed in the *London Times*, which has just reached this country is in part as follows:

The following are the average index numbers of the prices of 45 commodities, the average of the 11 years, 1867-77, being 100:

	Average.		Average.
1878-87.....	79	1898.....	64
1888-95.....	68	1899.....	68
1890-99.....	66	1900.....	75
1896-1905.....	68	1901.....	70
		1902.....	69
1883.....	82	1903.....	69
1889.....	72	1904.....	70
1896.....	61	1905.....	72
1897.....	62	1906.....	77

The index number is 5 points higher than in the preceding year, viz., 77, against 72, and is 23 per cent. below the standard period, which was equivalent to the average of the 25 years 1853-77, but it is 17 per cent. above the average of the lowest decade, 1890-99.

Articles of food were slightly lower than a year ago, but the rise for materials amounted to 10½ per cent., and their index number is the highest since the early part of 1880, when it stood at 89. As compared with the average of the 10 years, 1896-1905, the rise has scarcely affected articles of food, which are only 2 per cent. dearer, but materials stand 27 per cent. above that average, while the rise from the lowest point in 1895 amounts to as much as 54 per cent.

In the group of minerals Cleveland pig iron rose from 54s. per ton to 62s., hematite from 72s. to 80s. Standard copper was worth £79½ per ton at the end of 1905, touched £107¼ in December, the highest price since 1872, and closed at £105¼. Tin started from £161 per ton and touched £215 in May, a quotation unprecedented in the history of prices; it dropped to £164 in July, and stood at £193½ at the end. Lead went from £17¼ per ton to £20¼. House coal had moderate prices almost throughout the year, but jumped to 19s. 6d. per ton at the close, against 16s. 6d. a year ago.

Among textiles American cotton was worth 6.24d. per lb. at the end of 1905, and closed at 5.60d. in view of a very large crop. Flax is slightly lower, hemp and wool are a little higher, silk, and particularly jute, considerably higher than a year ago.

In a comparison with former periods the groups of minerals and textiles stand very much higher than the average of the last 28 years, while the value of articles of food is either normal or moderate.

Silver was again required for India, and the quantity shipped from here was the largest on record (valued at £15,000,000), though the total value may have been a little higher in 1857 and 1859, when the price of the metal was double as high as last year (nearly 62d. per oz.). Purchases were also made by the United States and France. The price touched 33¼d. per oz. in November, the highest since 1893.

The rate of discount was much higher. The average private rate for best bills in the three markets, London, Paris and Berlin, was over 3½ per cent., against 2½ per cent. in 1905 and 3¼ per cent. in 1900.

Gilt edged securities had a bad time, owing to the great demand for capital for more profitable employment, the special demand for gold and the consequently high money rates. Consols averaged 1½ per cent. less than in the previous year (88¼ against 89¼).

With reference to the prospects we must not forget that the level of many raw materials is now a high one, in some instances possibly due to speculation, and that a reaction may easily occur. But looking at the conditions all over the world there are certainly no signs of immediate danger. The industries everywhere are still well employed, and if reports can be trusted the production in many branches is sold forward for the better part of the year. It is, therefore, quite possible that we are only in the middle of a great movement and that activity will still continue for some time.

## PERSONAL.

W. E. Corey, president of the United States Steel Corporation, returned from Europe on Tuesday.

John Hayes Hammond, New York, has given \$22,000 to the Sheffield Scientific School, New Haven, Conn., for the further equipment of the metallurgical laboratory.

Frederick P. Kafka, manager of the New York office of the Unit Concrete Steel Frame Company, has resigned, to accept a similar position with the General Fireproofing Company, Youngstown, Ohio, whose New York office is at 156 Fifth avenue.

John E. Zimmermann, formerly secretary of the American Pulley Company, Philadelphia, was admitted as a partner in the firm of Dodge & Day, engineers, Drexel Building, Philadelphia, on January 1.

B. D. Quarrie, assistant superintendent of the American Steel & Wire Company's Central furnaces, Cleveland, Ohio, has resigned to become superintendent of furnaces for the Inland Steel Company at Indiana Harbor, Ind.

Wm. B. Dickson, second vice-president of the United States Steel Corporation, Thomas F. Cole, president of the Oliver Iron Mining Company, and John D. Ryan, are among applicants for a charter for the National Copper Bank of New York, which will start business in the new Trinity Building, 115 Broadway. The capital will be \$2,000,000, and the surplus of the same amount.

William A. Lewis, who has for years been general superintendent of the works of the Carnegie Steel Company at Sharon, Pa., and vicinity, has resigned to take a position with the Jones & Laughlin Steel Company at Aliquippa, Pa. A banquet in honor of Mr. Lewis was given by the superintendents and heads of departments of the Sharon and South Works of the Carnegie Steel Company on the evening of January 26, and he was presented with testimonials of their esteem.

Spencer Kellogg, president of the New York State Steel Company, Buffalo, N. Y., who recently underwent a severe operation, is making a good recovery.

Thomas M. Eynon, vice-president and general manager of the Eynon-Evans Mfg. Company, Philadelphia, Pa., has been appointed by the mayor of that city as engineer member of a commission appointed to investigate the advisability of the city regaining possession of the gas works from the United Gas Improvement Company, which has been held by the latter under lease for a number of years. Mr. Eynon will also act as secretary of the commission.

L. M. Hartzell has been appointed superintendent of the Bessemer department of the Homestead Works of the Carnegie Steel Company, to succeed E. G. Weisner, who has been made general superintendent of the Bessemer steel plants of the company at Bellaire and Mingo Junction, Ohio. Mr. Hartzell was formerly assistant to Mr. Weisner at Homestead.

Charles E. Pope, president of the Pope Tin Plate Company, Pittsburgh, has sailed for South Africa to be absent until about May 15.

Wallace H. Rowe, president of the Pittsburgh Steel Company, Pittsburgh, with his family, has gone to Camden, S. C., to remain until April.

R. C. Frampton, formerly secretary and treasurer of the Ruud Mfg. Company, Pittsburgh, manufacturer of hot water heaters, resigned his position on February 1 and has been succeeded by W. J. Langenheim.

In a new form of gliding boat constructed at Paris by Levasseur & Lein, of motor fame, the apparatus consists of a front boat of pointed and light construction, containing the motor and accessories. A large flat construction, in the form of a tail, extends for some 30 feet back into the water, and is connected to the boat by a short, light wood frame about 2 feet long. The rear end of the tail is almost submerged, while the front end, as well as the boat, appear to float upon the surface, and are almost lifted out of the water by the action of

the propeller. The latter is placed in the tail portion, and is operated by a shaft running back to it from the motor in front. The motor, which has eight cylinders, is designed for 50 hp., and, in calm water, is said to develop an extremely high speed in the odd craft. In rough water, the speed is only moderate.

## OBITUARY.

JOHN PHILLIPS, a pioneer iron manufacturer of Pittsburgh, died at his home in Carrick, Pa., last week, aged 84 years. When a young man he and his brother, James, formed a copartnership in the building and contracting business, erecting some of the then most important buildings in Pittsburgh and vicinity. About 1860 he joined the late William J. Lewis in establishing a bolt factory. In 1863 the late Henry W. Oliver became a partner, and the firm was then Lewis, Oliver & Phillips. After Mr. Lewis withdrew from the firm it was styled Oliver Brothers & Phillips, which later gave way to the Oliver Iron & Steel Company, of which Mr. Phillips was vice-president. The mine supply department of this enterprise was bought by Mr. Phillips and his nephew, John M. Phillips, was established separately in a plant on South Twenty-third street, and when Mr. Phillips retired from active business in 1900 it was incorporated as the Phillips Mine & Mill Supply Company. He is survived by his widow and five daughters.

WILLIAM L. SIMPSON, consulting mechanical engineer, died February 1 at his home in Philadelphia, Pa., aged 60 years. He was the founder of the Keystone Engine & Machine Works.

HENRY C. SERGEANT, late of the Ingersoll-Sergeant Drill Company, died at Westfield, N. J., January 30, aged 72 years. He was born in Ohio in 1835.

JOHN OSGOOD, for many years in the foundry business at Port Edward, N. Y., died at his residence in New York City January 31, aged 88 years.

WILLIS L. GOODRICH, formerly of Ossining, N. Y., died recently in Chicago. He was formerly connected with C. Sidney Shepard & Co., Chicago, and later went to New York to engage in the sale and manufacture of sheet metal goods. A few months since he returned to Chicago to take a position with the Republic Metalware Company, holding that connection at the time of his death. He was a member of the military order of the Loyal Legion.

EDWARD CHEETHAM, secretary of the American Stove Board Company, Chicago, died January 19. He had been intimately associated with hardware manufacturing lines since 1865, having been connected successively with the Chicago Stamping Company, the St. Louis Stamping Company and American Stove Board Company, being identified with the management of the latter company since 1899.

JOSEPH FLATHER, founder of Flather & Co., Inc., lathe manufacturers, Nashua, N. H., and the first president of the National Machine Tool Builders' Association, died February 3, aged 69 years. He had been sick for two weeks, suffering from an attack of heart disease.

H. C. WEBER, superintendent of the Weber Gas Engine Company, Kansas City, Mo., died at Phoenix, Ariz., January 21.

MANNIS HILB, surviving partner of the original firm of Hilb & Bauer, scrap iron dealers, Cincinnati, died January 29, aged 62 years. He had been a resident of Cincinnati for 45 years, for 42 of which he had been in the scrap iron business. The firm started in business in 1866 and continued until 1907, when a partnership was formed by the sons of the original firm. Mr. Hilb leaves two sons in the business.

The Northern Furnace at Port Henry, N. Y., which supplies the Worcester plant of the American Steel Wire Company with basic pig iron, is working poorly and may be forced to blow out.



### Connecticut Manufacturing Expansion.

The Boston *Transcript* makes the following interesting statement concerning Connecticut industries: The decision of the directors of the American Brass Company, Waterbury, to recommend an addition of \$2,500,000 to the capital stock of the company directs attention to the striking expansion of the capitalization of the metal goods industries in western Connecticut during the past year. The new stock which the brass merger is to issue will take the form of a stock dividend of 20 per cent., and will bring the total capitalization of the company up to \$15,000,000. A few months ago the company raised its capital stock from \$10,000,000 to \$12,500,000.

The Scovill Mfg. Company, Waterbury, which is one of the largest independent brass concerns in the United States, has added \$812,500 to its capital, expanding the total figure from \$3,250,000 to \$4,062,500. The Waterbury Mfg. Company, another corporation that manufactures brass goods, has multiplied its capital stock by five, having increased it from \$100,000 to \$500,000. Still another Waterbury brass concern, the American Pin Company, has issued \$100,000 in new shares, bringing the total up to \$300,000. The Bristol Brass Company, Forestville, has enlarged its capital from \$500,000 to \$700,000.

The growth of the brass industry in Connecticut during the past year has been notable. The industry is now a larger consumer of copper than it has ever been before. It has not been greatly embarrassed by the high price of copper thus far, because many of the concerns have been consuming the metal under contracts made on a lower level of quotations.

Various Connecticut concerns which manufacture metal products other than brass goods have also expanded their capital stock. Two allied companies in the Naugatuck Valley are in the list. One of them is the Waterbury Farrel Foundry & Machine Company, which has voted an increase from \$400,000 to \$440,000. The other is the Farrel Foundry & Machine Company, Ansonia, which has enlarged its capital stock from \$1,150,000 to \$1,200,000.

Several of the New Britain hardware companies have issued new shares with which to finance their growing operations. The Stanley Works, manufacturing iron butts, bolts and hinges, has enlarged its outstanding stock from \$1,000,000 to \$1,500,000. The Stanley Rule & Level Company has brought its capitalization from \$500,000 up to \$1,000,000. Landers, Frary & Clark, another New Britain concern that makes hardware and table cutlery, has increased its capitalization to \$1,000,000 by putting out \$250,000 in new shares. These changes indicate the remarkable growth which the metal industries of Connecticut are experiencing. Their financial operations have never before been conducted on such an expansive scale, and business is rapidly increasing in all directions.

**Railroad Motor Car Tests.**—Gasoline-electric railroad cars, with auxiliary storage batteries, are being operated on the Missouri & Kansas Interurban Railway, running west from Kansas City. During a trial trip of 550 miles on the lines of steam railroads in Kansas, one of the new cars averaged about 40 miles per hour, in spite of grades of  $3\frac{1}{2}$  per cent. and curves as high as 16 degrees. The cars measure 52 ft. 9 in. over all, 9 ft. 6 in. wide, and have trucks carrying the usual electric motors. A gasoline engine drives the dynamo, which furnishes current to either the motors or the storage battery. The latter is an important feature of the system, as it pulls the engine over the "peaks" of the load, such as those represented by the power required to overcome inertia in starting, and as a result the engine is much smaller than would otherwise have been necessary. When coasting down grade or standing at a station or slowing down the current is switched into the batteries, to be returned to the motors when called for. The parts are so arranged that if the engine should become disabled the batteries could carry the car 20 miles. The engine room is 14 ft.

8 in. long, the passenger compartment 27 ft. 5 in., and the smoking room 10 ft. 8 in.

### Census of the Coke Industry.

WASHINGTON, D. C., February 4, 1907.—The Census Bureau has prepared a bulletin, compiled by Prof. Charles E. Munroe, embracing 1905 census returns of the industry engaged in the manufacture of coke, as compared with the statistics of 1900 and preceding census periods. Special care has been taken in gathering and compiling these figures to avoid the duplication of statistics gathered and published by the U. S. Geological Survey, which are devoted chiefly to the product rather than to the plants and their operation.

#### Growth of Industry.

The wonderful growth of the coke industry in recent years is impressively shown by the figures representing the capital invested, which has increased from \$17,462,720 in 1890 to \$90,712,877 in 1905, and those covering the value of the product, which has increased from \$16,498,345 in 1890 to \$51,728,647 in 1905. Thus the capital is shown to have increased 419.5 per cent. in 15 years, while the value of the product has risen 213.5 per cent. The following table embraces a summary of the principal items of the returns for 1890, 1900 and 1905:

	1905.	1900.	1890.
Number of establishments.....	278	241	218
Capital .....	\$90,712,877	\$36,502,679	\$17,462,720
Wage earners.....	18,981	16,999	8,998
Total wages.....	\$9,304,498	\$7,085,736	\$4,072,632
Miscellaneous expenses..	\$4,891,130	\$2,184,068	\$394,784
Materials used.....	\$29,884,532	\$19,685,532	\$11,509,737
Coal:			
Short tons.....	36,781,006	30,157,829	15,795,087
Cost .....	\$28,360,121	\$18,355,252	\$11,110,700
All other materials...	\$1,524,411	\$1,310,280	\$399,037
Products, total value...	\$51,728,647	\$35,585,445	\$16,498,345
Coke:			
Short tons.....	24,733,063	19,640,798	10,008,169
Value .....	\$49,002,051	\$34,633,418	\$16,494,454
All other products...	\$2,726,596	\$952,027	\$3,891

#### Distribution of Coke Plants.

In addition to the establishments covered by the statistics in the above table which were employed exclusively in the manufacture of coke and its by-products there were 17 in which coke was produced as a minor product and which had an aggregate output of 410,225 tons of coke. There were, therefore, 295 establishments in the United States in 1905 which produced coke, distributed as follows: Alabama, 24; Colorado, 13; Georgia, 2; Illinois, 1; Indian Territory, 4; Kansas, 4; Kentucky, 7; Maryland, 1; Massachusetts, 1; Michigan, 1; Minnesota, 1; Montana, 2; New Jersey, 1; New Mexico, 2; New York, 3; Ohio, 6; Pennsylvania, 112; Tennessee, 9; Utah, 2; Virginia, 13; Washington, 3; West Virginia, 80; Wisconsin, 2; Wyoming, 1.

In 1900 the coking process caused a decrease of 34.9 per cent. in the weight of the coal and an increase of 88.7 per cent. in its value, while in 1890 the corresponding figures were 36.6 per cent. decrease in weight and 48.5 per cent. increase in value, and in 1880 they were 36.9 and 94.1 per cent. respectively. The amount of coal necessary to make 100 tons of coke was 148.7 tons in 1905, 153.4 tons in 1900, 157.8 tons in 1890 and 158.4 tons in 1880. The amount of coal necessary to produce a ton of coke continues to grow less, showing a continued increase in the efficiency of the coking operations.

#### Pennsylvania Still in the Lead.

As in the past, the coke production of Pennsylvania in 1905 greatly exceeded that of any other State, but the margin is steadily decreasing, for whereas in 1880 the product of Pennsylvania constituted 84.2 per cent. of the total, in 1890 it was 73.7 per cent., in 1900, 67.4 per cent., and in 1905 but 64.9 per cent.

In 1905 the coke producing States and Territories west of the Mississippi, including Minnesota, yielded 4 per cent. of the total output, and six States—Massachusetts, New York, New Jersey, Maryland, Minnesota and Wisconsin—operating ovens at a distance from the coal fields, produced 4.9 per cent. of the total. Massachusetts imported coal from abroad, but the major part of the supply for the other five States was drawn from the Appalachian fields.

W. L. C.

### No Electrical Combination in Great Britain.

No trust or combination of electrical machinery manufacturers is likely to be formed in Great Britain, according to recent comment on the subject by the technical press. Several attempts have been made to bring the manufacturers together, and it had been announced that the latest of these efforts was in a fair way to succeed. The *London Times Engineering Supplement* gives these reasons for thinking no such plan can be carried out:

In the first place, there are too many manufacturers in the country, without taking into account the fact that importation is absolutely unrestricted. Then it happens that of these home manufacturers there are many small firms which, for reasons that would occupy too much space to set forth, are less troubled by market demoralization than the leading companies with large capital accounts and heavy standing charges. And, to take an even more general view of the situation, it is unfortunately the case that most of either class cannot afford to await the results of a sound and deep laid plan for exercising control over the market, and no scheme is attractive to them which will not produce immediate improvement in revenue. Meanwhile it is repeatedly urged by outside critics that the British electrical manufacturer is slothful or niggardly in his attitude toward research and invention, presumably with the intention of implying that improvement may be found in the production of technical novelties. The common and perfectly sound reply to such charges is that the British manufacturer cannot afford in the present state of the industry to pursue any policy but one of naked and unshamed opportunism. It is also a most unhappy coincidence, if nothing more, that in the past the greatest trading disasters have overtaken some of the firms that were most enterprising in their efforts to press new types of machinery on the market. There does not appear to be a single instance of commercial success in this industry being plainly attributable to the possession of a superior technical staff. Both the consulting engineers and the managing engineers of this country will rarely take the responsibility of recommending innovations which have not been thoroughly tested abroad. Experience has taught them that this is the more prudent course to pursue. The manufacturer deems it more profitable to leave pioneer work to be done by the protected and virtually monopolist factories in other countries.

### Customs Decisions.

#### Duty on Scrap Tin.

The Board of United States General Appraisers has decided adversely to the importers, F. B. Vandegrift & Co., Philadelphia, a claim for the free entry of scrap tin, alleged to be the product of the United States, reimported. The merchandise was assessed for duty by the collector at the rate of 10 per cent. under the provision in the tariff for waste not specially provided for.

The Algoma Steel Company, Sault Ste. Marie, Mich., was sustained in a claim for free entry of molders' patterns, while a protest by the Sherwin-Williams Company, Cleveland, Ohio, relating to the classification of oxide iron ore was overruled.

#### The Blanket Variety of Customs Protests.

In a decision promulgated by the Board of United States General Appraisers February 2, notice was served generally on importers that the so-called blanket variety of customs protests is not in conformity with the Customs Administrative Act of 1890, providing for appeals from classifications imposed by collectors and other officers of the Treasury Department. The importing firm in the case at bar entered less than half a dozen different lines of merchandise, but filed a protest with the Board enumerating 24 different provisions of the tariff law under which the goods were claimed to be dutiable, while 50 different rates of duty alternatively were specified as applicable to the merchandise in controversy. The Board holds that, in instances where there is doubt as to which one of several enumerations an article may be entitled to, it is entirely proper for the importer to file alternative claims, but the protest under consideration is

referred to in the official decision as a "gross distortion" of the principle. The protest is therefore overruled on all grounds.

### The Canadian Bounty Question.

TORONTO, February 4, 1907.—The systematic and energetic campaign carried on in the agricultural constituencies by opponents of the iron and steel bounties has had rather a perturbing effect upon the Government. From riding after riding come largely signed petitions asking that Mr. Fielding's new bounty bill be abandoned, and that bounties altogether cease with the expiration of the present law, which holds until July 1. So numerous were the constituencies from which these petitions come, bearing in each case the signatures of thousands of voters, that the Government's decision was somewhat shaken. It decided to submit the question to a caucus of the members on its side of the House, and, after considerable discussion, the resolution was reached to stand by the bounties. There is reason to believe that the members representing ridings from which the demand came were in favor of the petitions being acted on, but the representatives of constituencies more concerned with manufacturing than with farming voted for the retention of the bounties.

While it was thus determined that the bounties should be retained, one or two other questions affecting them were left for subsequent consideration. A large section of the party in the House held that there ought to be some modification of the arrangement devised by the Minister of Finance. It was felt that while the Government could not be expected to go all the way to meet the wishes of the petitioners, it should concede the exclusion of foreign ore from the benefit of the bounty law. Very strong opposition to this proposal came from the representatives of Nova Scotia, who argued that such a narrowing of the basis of the bounty would mean the deprivation of the Dominion Iron & Steel Company and the Nova Scotia Steel & Coal Company of their present share of the public aid. The matter seems to be still under advisement. It is generally expected that the bounty bill now before Parliament will undergo some changes before it is finally enacted.

Another point raised in this bounty discussion within the ministerial camp relates to the application of the law to materials exported. As the old law stands, the bounty is due on all pig iron, puddled bars and steel ingots made in Canada, no matter where they are sold; but the bounty on wire rods, steel plate and structural forms is to be paid only where these articles are used in Canada. In the bill now before Parliament pig iron and puddled bars made in Canada will still be eligible for bounty whether they are sold in Canada or outside of Canada. In regard to steel ingots, however, there is this proviso that "on steel ingots from which steel blooms and billets for exportation from Canada are manufactured" no bounty shall be paid. Of rolled products, wire rods are the only ones embraced in the new bill, plates and structural forms both being dropped. The question of further limiting the bounties has been raised since the appearance of the petitions mentioned above and was discussed in the Government caucus last week. A section of the Liberal members advised that the bounty be restricted to products utilized in Canada, and that the exportation of iron or steel disqualify it for a bounty. It remains to be seen whether or not the Government will adopt this condition in its generality. At all events, an assurance was given that if the United States Steel Corporation should establish in Canada such great works as it has been credited with projecting here, and should it use those works as the basis of an export business, it would receive no bounty on the products exported. This comes very close to the proposition that bounties will not be paid on exported iron or steel. It is to be recalled that in 1897, when Mr. Fielding introduced his first bounty resolutions, he was in favor of confining bounties to products sold and consumed in Canada, and that he abandoned that purpose only upon the strong persuasion of his predecessor in the Finance Department, Mr. Foster, who is also a Maritime Province man.

C. A. C. J.



## NEWS OF THE WORKS.

## Iron and Steel.

The Cambria Steel Company, Johnstown, Pa., has recently purchased a large tract of land adjacent to its present works which gave rise to the report that it would soon start work on large additions to its plant. We are officially advised that this report is untrue, the company not having any plans under way at the present time for extensions.

The James A. Spargo Wire Company, Rome, N. Y., has placed contract for its new wire mill, 100 x 300 ft. The building will be erected on a 12-acre site which the company recently purchased.

The Shenandoah Steel Wire Company, Buffalo, N. Y., which is installing the machinery in its new plant, drew the first wire January 31 from 21½ to 33½ gauge on its No. 5 machines.

The Continental Steel Company, Cleveland, Ohio, manufacturer of nickel, chrome and tungsten steel, suffered a loss by fire on January 16, which completely destroyed its plant located at Chagrin Falls, Ohio. Since December 16, 1906, the Ohio & Pennsylvania Steel Company had operated the plant under a lease extending for a term of eight years. A new corporation is to be organized by a syndicate, now formed, which has purchased an option held by Messrs. Turner and Hill on a large brick plant at Chagrin Falls, and will at once start to equip it with modern steel making apparatus. Dimensions of the brick and stone structures are about 78 x 375 ft. and 32 x 150 ft., with a brick office building 26 x 60 ft. It is the purpose of the syndicate to construct a short railroad line to connect with the lines of the Erie Railroad.

The Seneca Iron & Steel Company, Buffalo, N. Y., completed its organization last week by the election of officers, as follows: James S. Patterson, president; Hugh Kennedy, vice-president; H. M. Van Horn, secretary, and Alexander Patterson, treasurer. The site of the company's plant is south of and adjoining the plant of the Lackawanna Steel Company. Ground has been broken for the main building, which will be 112 x 440 ft., and will contain seven hot mills and four cold mills. Work upon two other buildings will soon be commenced, each approximately 65 x 250 ft., one of which will be used for the galvanizing department and the other for the roofing and corrugating plant. The company's principal products will be black, galvanized, pickled and cold rolled sheets and corrugated forms for roofing, &c. The company expects to have the plant in readiness for operation about July 1 next. The Riter-Conley Company, Pittsburgh, has the contract for the erection of the buildings.

The new Federal Furnace at South Chicago was blown in on February 1. It was described in detail in *The Iron Age* of July 19, 1906. The officers of the Federal Furnace Company are: William L. Brown, president; C. P. Wheeler, vice-president, and A. F. Maynard, secretary and treasurer. The offices are in The Rookery, Chicago. Harry Kennedy is furnace superintendent.

The Columbus Iron & Steel Company, Columbus, Ohio, blew out one of its furnaces on January 28 for relining. It will probably be out for 30 days.

The Lackawanna Steel Company expects to blow in its new furnace, No. 7, in the early part of next week. As soon as No. 7 is making a normal output No. 1, which has now been in blast continuously for four years, will go out for relining and general overhauling. No. 3 furnace will also probably be blown out in the near future.

The No. 2 Paxton Furnace of the Central Iron & Steel Company, Harrisburg, Pa., which has been out for repairs for a number of months, was blown in on January 7.

Alleghany Furnace of the Alleghany Ore & Iron Company, at Iron Gate, Va., was blown in on January 6. The Buena Vista, Va., furnace of the same company, which has been idle for about six weeks, is expected to blow in this week.

No. 1 furnace of the Ashland Iron & Mining Company, Ashland, Ky., was blown out on January 15 for relining.

The Rockdale Iron Company, Rockdale, Tenn., expects to get its furnace in blast early in March. Improvements have been under way for some time, including new skip filling arrangements.

Steubenville Furnace of the Carnegie Steel Company, at Steubenville, Ohio, was blown out on January 16 for general repairs.

The work on the furnace plant of the Atkocan Iron Company at Port Arthur, Canada, is now practically completed, and it is expected that the furnace will be blown in very soon. The installation of the plant was the work of the Canada Foundry Company, Toronto.

## General Machinery.

J. W. Hemmerle, who on January 1 resigned the position of salesman with Samuel W. Hays Sons, manufacturers' agents, Pittsburgh, is now conducting a similar business under the title of J. W. Hemmerle & Co., 302 Times Building, Pittsburgh, representing the following companies in the Pittsburgh District: The Cleveland Crane & Car Company, Cleveland, Ohio, manufacturer of electric and hand power cranes; Mead-Morrison

Mfg. Company, New York, Boston and Chicago, coal handling and hoisting machinery, and the Hawley Down Draft Company, Chicago, manufacturer of Schwartz metal melting and refining furnaces. The new firm has received an order from the Carnegie Technical Schools, Pittsburgh, for one Schwartz 500-lb. furnace, to be installed in the foundry at the schools.

An order for 10 three-motor type cranes, ranging in capacity from 5 to 25 tons, has been secured by the Cleveland Crane & Car Company, Cleveland, Ohio, for installation in the new works of the Empire Bridge Company, Elmira, N. Y.

The American Foundry & Machine Company, Hamilton, Ohio, has applied for authority to increase its capital stock from \$25,000 to \$100,000. The additional funds will be used to make improvements to its present plant and to provide for future increases in capacity.

The Cleveland Twist Drill Company, Cleveland, Ohio, reports that the heavy demand for its machine tools continues. It has recently booked some good sized foreign orders. A fine new catalogue has just been gotten out by the company.

The Runyan Concrete Machinery Company, Cleveland, Ohio, which was recently organized with a capital stock of \$100,000, has opened a factory on Canal street and turned out the first machine last week. The company has already booked a number of orders. Fred A. Smith is president, and J. M. Runyan, the inventor of the machine, is the manager.

The Wellman-Seaver-Morgan Company, Cleveland, Ohio, has opened an office in Mexico City and has placed in charge William C. Benbow, who was formerly in charge of the Cincinnati office of the General Electric Company. The company reports a heavy demand for charging machines for furnaces and for electric hoists for mines. The company has recently booked a number of orders for hoists to equip mines in Michigan and Wisconsin, including one for Western mines, secured from the American Smelting & Refining Company. The company is also enjoying a large foreign demand for its hoists, having received an order for 12 double railed electric hoists from the Cra de Real del Monte y Pachuca Mines of Pachuca, Mexico.

The Ajax Mfg. Company, Cleveland, Ohio, is receiving an unusually large number of orders for heavy forging machines and large bulldozers. The company has orders for three 5-in. and five 4-in. forging machines. It also has an order for a big universal forging machine for the Bethlehem Steel Company. It recently sold large bulldozers to the Pennsylvania Steel Company, Steelton, Pa.; Ajax Forge Company, Chicago, Ill., and Cambria Steel Company. The company recently shipped to the Pennsylvania Railroad shops at Altoona, Pa., the largest bulldozer ever turned out at its factory, weighing 138,000 lb. The company has within a short time booked 15 foreign orders, one for a bulldozer and the rest for forging machines. Four of the orders came from France and the rest from England. The company is also rushed with orders for nut machines, the demand for these machines having increased, and is unable to make deliveries inside of about two months. The company expects to close a deal in a few days for a site for a new plant, having outgrown its present capacity, though it does not expect to build until next year. I. H. Platt, who has been foreign representative of the company for the past seven years, is home on a short vacation.

The Cleveland City Forge & Iron Company, Cleveland, Ohio, reports a very heavy demand for light forgings and a good supply of orders for heavy forgings. The large amount of forgings required by the American Ship Building Company is keeping manufacturers of heavy forgings busy at the present time. The most difficult heavy forging ever turned out by the company has just been completed for the William Cramp Ship & Engine Building Company for a large turbine ocean steamer. The company is now engaged in making two 26-in. shafts, weighing 25 tons each, and numerous other forgings for an ocean steamer being built by the W. A. Fletcher Company, Hoboken, N. J. The Cleveland City Forge & Iron Company is also turning out a 12-in. shaft, 32 ft. long, for the Ohio River steamer Queen City, and a number of hull and engine forgings for the American Ship Building Company. It also has a heavy demand for car axles and is now turning out 150 axles per day. The company is erecting a large two-story office building.

The Ajax Forge Company, Chicago, has secured by lease additional ground space, 170 x 223 ft., upon which to build an addition to its works. All machinery and other supplies for the new improvement have been contracted for.

The Mobile & Ohio Railroad contemplates the enlargement of its roundhouse at Meridian, Miss., but has no intention of building shops there, as has been reported.

Recent contracts taken by the B. F. Sturtevant Company, Boston, Mass., for complete heating and ventilating systems for manufacturing plants, include the American Locomotive Company, Dunkirk, N. Y.; Sutro Bros. Braid Company, West New York, N. J.; Massy-Harris Company, Brantford, Ont.; W. C. Edwards Company, Ottawa, Ont.; Camden Anchor-Rockland Machine Company, Camden, Maine. Full complement of stationary forges, blowers, &c., for equipment of forge shops: Standard Steel Car Company, Hammond, Ind.; Sydney Steel Scraper Company, Sydney, Ohio, and Pond & Bond, Chicago, Ill. New rotary type of high pressure blowers: R. M. Wilkin-

son, Norfolk, Va.; Economical Power, Light & Heat Company, Toronto, Ont.; Central Foundry Company, South Pittsburgh, Tenn.; D. & W. Fuse Company, Auburn, R. I.; E. C. Stearns & Co., Syracuse, N. Y. Generating sets with inclosed forced lubrication engines: Hudson Companies, Jersey City, N. J.; American Milling Company, Linden, Ind.; Maryland Steel Company, Sparrow's Point, Md.; Cox & Sons Company, Swedesboro, N. J.; Bristol Water Works, Bristol, Pa. An important contract has just been closed with the International Paper Company for an equipment of Sturtevant economizers for at least 20,000 boiler horsepower in its various plants.

The New York Blower Company, Bucyrus, Ohio, has arranged for the engine, generator and part of the boiler equipment for its new plant, but it may be in the market a little later on for a 70-hp. return tubular boiler, feed water heater and boiler feed pump. The company is not ready to take this matter up at the present time. As it is the intention to drive all the machine tools either individually or in groups by motors, the company will be in the market for these motors.

The Exeter Machine Works, Pittston, Pa., recently received a contract from the Wall Paper Company, Incorporated, London, England, for a complete coal handling outfit to be erected on the River Thames.

It is understood that the Mobile & Ohio Railroad is contemplating extensive improvements in the Jackson, Tenn., shops, which will probably be made the largest shops on the line.

Recent orders received by the Thomas Carlin's Sons Company, River avenue, Allegheny, Pa., of which shipments are going forward, include two grinding pans for Tennessee, one for New Jersey and one for New York. This company is receiving large orders for shears, shipments having recently been made to New Jersey, Alabama and Missouri. During 1907 over 900 carloads of incoming and outgoing freight were handled.

#### Power Plant Equipment.

The Best Mfg. Company, Pittsburgh, maker of complete piping equipment for power plants and blast furnaces, has received a contract for the water and gas piping system, including pipe, valves and fittings, for the large addition which the Seamless Tube Company is making to its plant at Ellwood City, Pa. The contract will be finished in from two to three months.

The Kentucky Electric Company, Louisville, Ky., has purchased a site upon which it will erect a new plant, bids for the construction of which will soon be asked.

The Power Specialty Company, New York, owing to increasing business has found it necessary to again enlarge its offices. As soon as such additional space becomes available, through the completion of the Trinity Building Annex, the company's offices will be rearranged and enlarged so as to include the entire Broadway front of the floor at present occupied by it. Among orders recently received for the Foster superheater for installation in the various best known types of water tube boilers are the following: Northern Colorado Power Company, Denver Gas & Electric Company, Norwich & Western Railroad, Haverhill Electric Company, Electric Company of America, Allis-Chalmers Company, Westinghouse, Church, Kerr & Co., Westinghouse Electric & Mfg. Company, and Ingersoll-Rand Company. Each order calls for upward of 5000 hp.

The Ridgway Dynamo & Engine Company, Ridgway, Pa., has completed and is now putting into service the new brick addition to its plant, 65 x 200 ft. The building, which will be used as an erecting shop and storage for finished machinery, is served by a 30-ton traveling crane with a 5-ton auxiliary hoist. A switch from the Pennsylvania Railroad runs through one side of the building, making it convenient to load and unload material from the cars by means of the crane. The total floor space of the entire works now amounts to 3 acres, and seven overhead traveling cranes are in constant use, serving 75 per cent. of the floor space. All the machinery is electrically driven, the larger machines being provided with individual motors and the smaller ones being driven in groups by motors of from 10 to 30 hp. Compressed air is piped to all parts of the plant for operating the molding machines, hoists, drills, hammers, &c.

The new plant built by the United States Radiator Company at Corry, Pa., manufacturer of steam and hot water radiators, has been equipped with a modern power plant consisting of a 125-hp. Bessemer gas engine, Burk generator and Bullock motors.

The David Wigert Boiler Works, Galesburg, Ill., manufacturer of smoke consuming appliances, has been incorporated with a capital stock of \$100,000. The officers are David Wigert, president and general manager; Douglas Vaughn, vice-president, and B. F. Butler, secretary and treasurer.

#### Foundries.

The Richard Mfg. Company, Bloomsburg, Pa., has contracts to furnish the cast iron bends required in the pneumatic mail conveyors being installed at Philadelphia and other cities.

Though damaged by fire on January 22 to the extent of \$125,000, the Hill & Griffith Company, Cincinnati, Ohio, manufacturer of foundry facings, supplies and equipment, has already resumed business and is accepting orders which from now on it hopes to be able to fill promptly. Pending the rebuilding of the plant the company will have its temporary offices at 1249 State avenue.

The St. Louis Malleable Casting Company, St. Louis, Mo., manufacturer of malleable and gray iron castings, has let contracts for additions to its present plant at 7701 Conduit avenue, consisting of two buildings, one 60 x 320 ft. and the other 80 x 120 ft. In addition the company is building two melting furnaces which will have a capacity of 25 tons per day. With these improvements the capacity of the present plant will be practically doubled. The following officers have been elected: Geo. J. Kosbusch, president; Henry Luedinghaus, vice-president; A. W. Phelps, general manager, and Chas. G. Ette, secretary and treasurer.

The foundry of the C. G. Bretting Mfg. Company, machinist, founder and boiler maker, Ashland, Wis., which was destroyed by fire last December, has been rebuilt and is now in operation.

The Orr Foundry Company, Orrville, Ohio, has been incorporated with a capital of \$10,000, the incorporators being Geo. Wendling, C. O. Henderson, S. M. Brennehan, C. Smith and B. G. Cope.

The fire which on January 21 damaged the plant of the Geo. H. Smith Steel Casting Company, Milwaukee, Wis., was not as destructive as first reported. Operation of the plant was not interfered with, and the auxiliary buildings destroyed will be replaced by a larger fireproof addition to the present foundry.

J. E. Price, who has been in the foundry business for 40 years, most of the time in Chattanooga as a member of the Price-Evans Foundry Company, retires from active connection with the company and has sold his main interests to Harry Griscom and Clarence Converse. Mr. Converse was formerly with the Chattanooga Roofing & Foundry Company, but for some time has been with the Price & Evans Company. Mr. Griscom has been with the Chattanooga Roofing & Foundry Company for several years.

#### Motors and Small Engines.

What is said to be the largest contract for small marine gasoline engines ever secured in this country was awarded a few days ago to the Ferro Machine & Foundry Company, Cleveland, by the W. H. Mullens Company, Salem, Ohio, sheet metal worker and boat builder. The contract was for 500 Ferro automobile engines at an approximate price of \$85,000.

#### Bridges and Buildings.

Dodge & Day, engineers, Philadelphia, Pa., are building the new shops for the Jones & Lamson Machine Company at Springfield, Vt. The work is being pushed as rapidly as possible and the order for the steel has already been placed. The new building for the Bridgeport Brass Company, which is being engineered and constructed by Dodge & Day, is well under way, the steel having been ordered and the foundation work nearly completed.

#### Fires.

The plant of the Imperial Porcelain Works, Trenton, N. J., was burned February 3, the loss being about \$20,000.

The plant of the Federal Railway Signal Company, Troy, N. Y., was burned February 1. The loss is placed at about \$50,000.

#### Hardware.

A. S. Morss Company, maker of marine hardware, &c., Boston, Mass., which has for some time found its facilities taxed to the utmost in handling its expanding business, has lately made a 50 per cent. increase in its capital stock. With enlarged resources the company will be amply equipped to take care of its growing trade and will be enabled to carry a considerably larger stock of goods.

Seymour Mfg. Company, Seymour, Conn., manufacturer of sheet brass and German silver, copper, brass and German silver wire and tubing, &c., has recently increased its facilities for turning out high grade nickel anodes.

A cutlery company has been organized in Smethport, Pa., and a plant will be put into operation soon. The directors are Charles McKean, H. H. Redfield, T. H. Pancoast, C. D. Canes, S. L. Fry, William Monheimer and O. J. Hamlin.

The Cleveland Hardware Company, Cleveland, Ohio, has now in operation a new plant which it was compelled to erect because of its rapidly growing business. The new plant consists of a forge building, 120 x 260 ft., in addition to a power house, and is located on a 20-acre site that will be built up as the growth of the company's business demands.

The Otto Konigslow Mfg. Company, Cleveland, Ohio, metal stamper, has doubled the capacity of its plant during the past year. The company reports a very heavy demand at the present time for automobile stampings and hardware specialties. The company is now turning out at the rate of 2000 to 3000 a day an improved cold rolled steel coat hanger that can be taken apart and folded up into small compass.

The Ohio File Renewing Company has been organized in Youngstown, Ohio, as a branch of the American File Renewing Company of New York City. A factory building will be secured at an early date. Clyde Calvin will be secretary, treasurer and general manager of the company.

The Western Wire Goods Company, Buffalo, N. Y., which was some time ago reorganized and reincorporated, has pur-



chased the four-story factory premises, 115 x 180 ft., on Clinton street formerly occupied by the Sidney Shepard Company and has equipped the plant for the manufacture of bright wire goods, kitchen utensils, screw eyes and special wire work, in which a large business has been built up. The president is C. E. Wettlaufer; treasurer and manager, Alfred K. Finley, and secretary, George C. Finley.

The Denison Mfg. Company, Warren, Ohio, has purchased a site and will build a new factory at once. The business of the company has outgrown the capacity of the present plant.

A company with a capital stock of \$25,000 is being formed in Bellevue, Ohio, for the establishment of a factory for the manufacture of bed springs, folding steel sanitary couches and davenport. J. L. Moore, the inventor, J. P. Ruffing, A. A. Ruffing, G. W. Knox and M. J. Callaghan are the incorporators.

The New Departure Mfg. Company, Bristol, Conn., has bought the business and plant of the Liberty Bell Company, Bristol, and will consolidate the business with its own. The two companies have been competitors in bells. Now the New Departure Company will concentrate this branch of its business in the Liberty Company's plant, which will be known as the bell department of the New Departure Mfg. Company. The large factories of the company will be devoted entirely to the manufacture of brakes, automobile parts and bearings and other automobile accessories. The Liberty Bell Company was capitalized for \$50,000 and had been doing business since 1897.

The Cyclone Woven Wire Fence Company, manufacturer of ornamental fence and gates, has moved its headquarters from Holly, Mich., to Cleveland, Ohio.

The Automatic Water Heater Company, Rockford, Ill., has recently been incorporated with a capital stock of \$10,000, for the manufacture of hardware specialties, the chief of which will be a line of automatic gas water heaters and an automatic hydraulic valve, designed to dispense with the use of springs. It is expected that the new company will be ready for operation and have its product on the market in the early spring.

Marshfield, Wis., has secured a new manufacturing enterprise in the Badger Fence Machine Company, maker of wire fence tools. The company is composed of George H. Welton, president; G. N. Harrington, manager, and Fred. E. Graham, secretary and treasurer.

A Rhode Island charter has been issued to the Metallic Shell & Tube Company, with a capital stock of \$150,000, to manufacture stampings, tubes, rods, shells, &c. The incorporators are: Henry E. Smith, Cranston, R. I.; George B. Champlin, Warwick, R. I., and Leslie E. Hooker, Binghamton, N. Y.

The M. B. Schenck Company, Meriden, Conn., manufacturer of casters, is to start up the Breckenridge Foundry in that place, which has been idle for the past three years. The company has been buying its castings from out of the city for some time, but hereafter will manufacture them for itself. The company formerly operated the foundry for about two years.

#### Miscellaneous.

The Wheeling Enameled Iron Company, whose plant is at Elmwood, W. Va., has recently built a new warehouse, 40 x 100 ft., and is contemplating the erection of several other new buildings.

The Pressed Steel Car Company, Pittsburgh, has received an order from the Chesapeake & Ohio Railroad for 4000 steel cars.

The Pullman Company, Wilmington, Del., whose shops were recently damaged by fire, informs us that it will not require any new machinery to equip the parts of the plant which it will rebuild.

The Perfection Spring Company, Cleveland, Ohio, manufacturer of automobile springs, has increased the capital stock from \$20,000 to \$50,000.

The Stickler Weedless Wheel Company, Portage, Wis., has been incorporated with a capital stock of \$10,000 to manufacture propellers for motor boats.

The Lloyd Mfg. Company has been incorporated at Menominee, Mich., to engage in the manufacture of metal wheels, wheeled vehicles, wire working machinery, mechanical appliances and novelties. The company is capitalized at \$400,000, and the incorporators are Franklin A. Ulmsted, John Henes, C. I. Cook, Warren S. Carpenter and Marshall B. Lloyd.

The F. E. Bowers Company has been organized at New Haven, Conn., to manufacture the Bowers carburetor, a new type. The incorporators, under a Connecticut charter, are Fredson E. Bowers, Clarence S. Spaulding, Harold T. Warren and Edward B. Spaulding, all of New Haven. The capital stock is \$10,000. The site for a new factory has not been chosen.

The Kent County Gas Company has petitioned the Rhode Island Legislature for a charter and proposes to establish a gas plant in that section of Rhode Island as soon as the corporation can be formed. Edwin E. Arnold, 53 Canal street, Providence, is one of the incorporators.

At the annual meeting of the Detroit Copper & Brass Rolling Mills, Detroit, Mich., held on January 22, L. H. Jones was elected president and general manager; Theodore D. Buhl, first vice-president; Richard P. Joy, second vice-president; Wm. F. Mont-

gomery, secretary and treasurer, and Frank H. Hoffman, assistant secretary.

The Clark & Cowles Valve Company, 135 Broadway, New York, recently incorporated, has succeeded to the valve business formerly owned and controlled by S. S. Seagrave, who has offices at 50 West Broadway, New York; 14 St. Sacramento street, Montreal, Can.; 1579 Woodward avenue, Detroit, Mich., and Walkerville, Ont. The company has a factory in Brooklyn which it is enlarging to take care of the demand for its hydrant cut off valves. Walter G. Clark is president; R. A. Cowles, vice-president; H. A. Wilson, secretary, and G. W. Kyburg, treasurer.

The Roux Wire Die Company, Rome, N. Y., has incorporated with a capital stock of \$5000 to manufacture diamond dies and machinery. Oliver Shiras of the Wire & Telephone Company of America, Rome, is interested.

The Perfected Inverted Light & Mfg. Company has been incorporated at Buffalo, N. Y., with a capital stock of \$20,000, and has leased factory premises on Niagara street, which are being equipped for the manufacture of patent burners for illuminating gas. Jas. F. Reilly is president and Shirley M. Stowell is secretary, treasurer and manager.

Being sold up for the first six months of the present year and having a steadily increasing demand for its products the Pittsburgh Tubular Steel Whiffletree Company, Ridge avenue, Allegheny, Pa., will increase its facilities for making a larger output. Arrangements have been made for occupying the building, measuring 75 x 100 ft., adjoining the present plant, possession of which will be taken February 1. J. A. Buchanan of this company is at present on the Pacific Coast booking orders for fall delivery. It is expected that he will return March 1.

The S. Obermayer Company, Cincinnati, Ohio, has just completed at Larrimer, Pa., the largest seasonal factory in this country.

The G. H. Williams Company, Cleveland, Ohio, reports a large demand for its clam shell buckets during the past month. Among the special orders recently placed with this company is one from the Dunbar & Sullivan Dredging Company, Buffalo, for an excavating bucket weighing 14,000 lb., that will be used in excavating 75 ft. under water in tunnel work in the Detroit River. The company also has a contract for a revolving derrick and bucket for the Rogers Sand Company, Pittsburgh.

The Michigan Lubricator Company, Detroit, Mich., manufacturer of brass steam specialties, has not only rebuilt the portion of its plant destroyed by fire on December 5, but has also added another story to the entire plant.

The Peerless Pattern Company has been organized in Akron, Ohio, and has opened a shop for the manufacture of patterns of all kinds, with wood patterns as a specialty. R. C. James and Calvin Barnes are at the head of the company.

The Bryan Insulating Fibre Company, Bryan, Ohio, has been incorporated with a capital of \$25,000 for the manufacture of telephone receivers and mouth pieces from a wood fiber compound made by a secret process. A new factory will be built and machinery installed. H. J. Myers is president; E. B. Willett, vice-president; E. A. Wolff, secretary and treasurer; A. F. Young, general manager.

The American Car & Foundry Company has prepared plans for a new millwright shop, 40 x 80 ft., three stories, at its Detroit works.

The Lyman Mfg. Company, Buffalo, N. Y., organized some months since to manufacture the Farrell-Lyman ball and cage globe valve, has now been incorporated under the same name, and in addition to valves will manufacture metal specialties and devices, hardware, plumbers' and automobile supplies, under contract. The company is building a new brass foundry and trebling the floor space of its machine shop and will add considerable new equipment.

A movement is on foot at Beaumont, Texas, to organize a car company with a capitalization of \$100,000 to construct a plant for the manufacture of logging and railroad freight cars. B. J. Cobb of Marshall, Texas, a practical foundryman, is interested.

The Turner Brass Works, Chicago, brass founder and finisher and manufacturer of mechanical appliances, now located at Franklin and Michigan streets, has just broken ground for a new factory at Sycamore, Ill., which it hopes to have in operation about May 1. The new shop will be 100 x 400 ft. and will have ample switching facilities. Power and tool equipment have been purchased.

At the annual meeting of the stockholders of the Guerber Engineering Company, Bethlehem, Pa., held January 29, the following were elected as members of its Board of Directors: A. N. Cleaver, Owen F. Leibert, F. C. Stout, Wm. B. Myers, Chas. M. Dodson, J. A. Eberts, Jos. W. Adams, P. A. E. Guerber and W. A. Wilbur. The directors elected the following officers to serve for the ensuing year: President, A. N. Cleaver; vice-president, F. C. Stout; treasurer, Wm. B. Myers; secretary, Franklin H. Brunner; manager, J. E. Boatrite; superintendent, P. A. E. Guerber; superintendent of manufacture, H. B. Walters.

## The Iron and Metal Trades

In the markets east of the Allegheny Mountains there has been little movement during the past week, after the heavy business done in January. The demand, both for early and later delivery, is rather light, and a canvass of the trade in different sections indicates considerable indifference at the present level of prices. Considerable foreign Iron is coming in and is still due, but prices are lower, one cargo to arrive in the Delaware having been sold at a shade over \$21. In the Central West and in the Chicago District there is a good deal of inquiry for the second half, notably for Malleable Bessemer. Pittsburgh reports that the Jones & Laughlin Steel Company has purchased a considerable quantity of Bessemer Pig to make up for inadequate output of its own furnaces, some of which are out of blast.

The protests against making the advance in rates of freight from Southern furnaces of 25c. per ton effective on February 1 have been successful, and March 3 is now named as the date. The larger Southern furnace companies are holding firm on the basis of \$18.50 at Birmingham for No. 2, for the second half, but the smaller concerns seem willing to accept less. Spot prices at Birmingham have come down.

The Steel market is easier east of the Allegheny Mountains, the Western mills being willing to deliver at \$32. Eastern Steel works are not generally meeting that price, and are cautious as to commitments for the second half.

Comparatively little business was put through in Steel Rails. One inquiry now in the market is from the Council City & Solomon River Railroad in Alaska for 10,000 tons.

The tonnage placed for Plates is stated to have been unprecedented, and the leading mills are now crowded with work for the next four or five months.

Specifications for Structural Material have been coming in at a satisfactory rate during the past few weeks.

The American Bridge Company took a total tonnage of 52,000 tons in January out of a total estimated tonnage of 90,000 tons for all the shops. This included about 32,000 tons of Bridge work. The entire contract for the 15,000 tons for the Corn Products Company's buildings has been placed.

There has been a tremendous pressure for Tubular goods. Among the orders recently placed is one lot of 4000 tons for the Pennsylvania Company. Quite a number of moderate sized contracts for Cast Iron Pipe are cropping up.

The demand for Sheets and for Steel Bars continues lively, and premiums of 10c. per box are being paid for Tin Plate for delivery during the third quarter.

## A Comparison of Prices.

Advances Over the Previous Month in Heavy Type.  
Declines in Italics.

At date, one week, one month and one year previous.

	Feb. 6, 1907.	Jan. 30, 1907.	Jan. 2, 1907.	Feb. 7, 1906.
<b>PIG IRON, Per Gross Ton:</b>				
Foundry No. 2, Standard, Philadelphia	\$26.50	\$26.50	\$25.75	\$18.50
Foundry No. 2, Southern, Cincinnati	26.00	26.00	26.00	16.75
Foundry No. 2, Local, Chicago	25.50	25.50	25.50	19.00
Bessemer, Pittsburgh	22.35	23.35	23.35	18.35
Gray Forge, Pittsburgh	22.35	22.50	22.85	17.35
Lake Superior Charcoal, Chicago	27.00	27.00	26.00	20.50

<b>BILLETS, &amp;c., Per Gross Ton:</b>				
Bessemer Billets, Pittsburgh	29.50	29.00	29.50	26.00
Forging Billets, Pittsburgh	36.00	36.00	36.50	32.00
Open Hearth Billets, Phila.	33.00	33.00	34.00	29.00
Wire Rods, Pittsburgh	37.00	37.00	37.00	35.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

<b>OLD MATERIAL, Per Gross Ton:</b>				
Steel Rails, Melting, Chicago	18.00	18.00	18.00	16.00
Steel Rails, Melting, Philadelphia	18.75	18.75	20.00	17.25
Iron Rails, Chicago	27.00	27.00	28.00	22.50
Iron Rails, Philadelphia	27.50	27.50	27.75	23.00
Car Wheels, Chicago	24.50	24.50	25.00	19.00
Car Wheels, Philadelphia	22.50	23.00	23.00	18.75
Heavy Steel Scrap, Pittsburgh	18.25	18.50	20.00	16.75
Heavy Steel Scrap, Chicago	16.00	16.00	17.00	14.50
Heavy Steel Scrap, Philadelphia	18.50	18.50	19.50	16.50

### FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.93½	1.93½	1.88½	1.83½
Common Iron Bars, Chicago	1.81½	1.81½	1.81½	1.75
Common Iron Bars, Pittsburgh	1.80	1.80	1.80	1.85
Steel Bars, Tidewater, New York	1.74½	1.74½	1.74½	1.64½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.80	1.80	1.65	1.57½
Skelp, Sheared Steel, Pittsburgh	1.90	1.90	1.70	1.60

### SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.50	2.50	2.50	2.30
Wire Nails, Pittsburgh	2.00	2.00	2.00	1.85
Cut Nails, Pittsburgh	2.05	2.05	2.05	1.80
Barb Wire, Galv., Pittsburgh	2.45	2.45	2.45	2.30

METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	25.00	24.75	23.75	17.87½
Spelter, New York	7.00	7.00	6.80	6.10
Spelter, St. Louis	6.75	6.75	6.55	5.95
Lead, New York	6.30	6.30	6.30	5.75
Lead, St. Louis	6.10	6.10	6.05	5.52½
Tin, New York	42.50	41.87½	41.85	36.20
Antimony, Hallett, New York	25.00	24.50	25.00	14.25
Nickel, New York	45.00	45.00	45.00	40.00
Tin Plate, 100 lb., New York	\$4.09	\$4.09	\$4.09	\$3.69

## Philadelphia.

PHILADELPHIA, PA., February 5, 1907.

The Iron market is in an unusually complicated condition, and it is difficult to define it with entire accuracy. There are so many various reports afloat and in some cases they are so specific that one is almost inclined to think that the market is on the verge of a decline. Upon a careful investigation, however, there seems to be absolutely no basis for any statement of that kind. For months past quotations have covered a wide range, prices being governed almost entirely by the date set for delivery. In some cases spot lots have been forced to abnormally high prices, and in others persons not thoroughly in touch with the market, or with lack of confidence in values, accepted comparatively low prices, so that if one reports the market lower and the other reports it strong they may both be correct, subject to the conditions named. As a general thing, however, it may be confidently asserted that so far as regards this territory, the market is not weak, neither can it be said to be lower except that the premiums are less than they have been for the past five or six weeks. The scarcity of Pig Iron for immediate delivery is in some cases a very serious matter, as foundries have no Iron to go on with and their molders are giving up their jobs rather than have to work so intermittently. The same conditions apply in some measure to the Steel mills who seldom find themselves with more than two or three days' supply in their yards, and sometimes they are on the very verge of having to shut down on account of the want of material. The consequence is that spot Iron



still commands a premium of \$1.50 to \$2.50 a ton beyond that for the third and fourth quarters, and while consumers hope for better deliveries in the near future there is really nothing apparent to justify their expectations, as the furnaces are almost waterlogged, and unless they can do better then they are now doing it will require weeks before supplies become anything like normal, and even then it is an uncertainty. Foreign Iron is still depended upon to give some measure of relief, and it probably will, as there is a considerable amount of that grade of Iron to come forward within the next 30 to 60 days, but there appears to be little probability of any decline from the rates now ruling. For the last half of the year sellers are willing to enter a considerable amount of business, but they are not inclined to make concessions from their recent asking prices, as they consider that the chances of a good market will extend well on toward the close of the year, and are therefore disposed to get their prices or maintain their present position.

**Pig Iron.**—The feeling is rather unsettled, as opinions in regard to the future are very much mixed. There is a good deal of business doing, however, and, so far as regards the later months, prices are stronger, and while there is no weakness as regards deliveries during the first half, the premiums for such are not quite as rigid as they have been. The shortage of Pig Iron is very great, however, and furnaces seem to be almost hopelessly behind with their deliveries, and for the time being at any rate there is no prospect of amendment. In some quarters the situation is regarded as very serious. The consumers have little or nothing in the yards, while the makers of Pig Iron are so besieged for what they can turn out that there is no encouragement to hope for betterment in the near future. Some of the larger companies are getting further behind than ever, and the working of the furnaces is so unsatisfactory that it is feared that less, rather than more, Iron will be produced during the next two or three months. Inquiries from large consumers are for considerable sized lots, which, however, the furnaces are afraid to quote on, as they are somewhat doubtful in regard to making the deliveries which are required. If all the business was accepted that is offered very full prices could be obtained, but, as we said before, there is a decided hesitancy in committing themselves to large lots for the deliveries required, which are mostly for the second and third quarters. In making quotations as shown below it should be said that in some cases, particularly for early deliveries, more money has to be paid, but taking it on the whole it is evident that the range between the second and third quarter is becoming more uniform, while for the last quarter it is in some cases a little easier, but not enough to affect the general result. The situation is so peculiar, however, that the market is liable to be easily influenced by developments which may be met from week to week. The large importations of foreign Iron have undoubtedly checked any further advance in special Irons, and will probably continue to affect the market according to the quantity which may be for sale during the next month or two. The arrivals during December were about 70,000 tons, and during January will not be very much less, but prices have not been materially affected, nor is it certain that they will be. It is true that Middlesbrough can be imported at from \$20 to \$20.50, but the charges for marketing and various incidentals require that at least \$22 should be realized to allow a reasonable margin for profit. Spot Iron from our own furnaces is so scarce that foreign Iron is readily accepted as a substitute, but the importer has to take all the chances of a decline, which while not apparent yet, may become so at some time in the not distant future. Consequently they depend upon not less than \$22.50 as a fair remuneration. Appearances to-day, so far as regards this territory, are that the market is strong, and while there may not be any advance (and no one wants to see it), yet the chances of a decline are infinitesimally small. To-day's prices for the various grades and various dates for deliveries in eastern Pennsylvania and adjoining territory would average about as follows:

#### First Half 1907.

No. 2 X Foundry.....	\$26.50 to \$27.00
Standard Gray Forge.....	22.50 to 23.25
Basic.....	25.00 to 25.50
Low Phosphorus.....	26.50 to 27.00
Malleable.....	25.50 to 26.00
Middlesbrough No. 3, on dock.....	22.50 to 23.00
Scotch, on dock.....	25.00 to 25.25

#### Last Half 1907.

No. 1 X Foundry.....	\$26.00 to \$26.50
No. 2 X Foundry.....	23.75 to 24.50
No. 2 Plain.....	23.00 to 23.25
Standard Gray Forge.....	22.00 to 22.50
Basic.....	23.25 to 23.75
Low Phosphorus.....	26.50 to 27.00
Malleable.....	24.00 to 24.50

**Ferroalloys.**—There is so much discrepancy in quotations that it is absolutely impossible to feel sure what the market is. It is lower, however, and it is said that some sales of spot lots have been made at less than \$74. The lots were not large, but it indicates considerable weakness when holders will accept such figures for small lots, spot delivery.

For the last half of the year prices are nominally \$70 to \$71, but it is said that better can be done, and it is probably correct.

**Steel.**—The demand for Steel is not large, but prices are steady and unchanged at the figures recently ruling—namely, \$33 to \$34 for Soft Steel and \$36 to \$40 for Forging Steel. Specifications on old orders come in very satisfactorily, however, so that the mills are running to full capacity and have plenty of work for some time to come.

**Plates.**—Plates for prompt shipment are not readily obtained, even at the advanced figure which was made some weeks ago. Mills are somewhat hampered by the difficulty in securing Pig Iron to keep them in full operation. Consequently, there is a corresponding short supply of Plates for immediate shipment. Prices are unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	2.13½	2.18½
Flange or Boiler Steel.....	2.23½	2.28½
Marine.....	2.53½	2.58½
Locomotive Firebox Steel.....	2.63½	2.68½
The above are base prices for ¼-in. and heavier. The follow- ing extras apply:		
3-16 in. thick.....		\$0.10
Nos. 7 and 8, B. W. G.....		.15
No. 9, B. W. G.....		.25
Plates over 100 to 110 in.....		.05
Plates over 110 to 115 in.....		.10
Plates over 115 to 120 in.....		.15
Plates over 120 to 125 in.....		.25
Plates over 125 to 130 in.....		.50
Plates over 130 in.....		1.00

**Structural Material.**—There is a good demand for almost all the various sizes and mills are fully employed, although the current demand is mostly for small and medium sized lots to meet immediate requirements. Prices are unchanged at 1.83½c. to 2c. for Beams, Angles and Channels, according to specifications.

**Bars.**—The Bar trade is in good condition, mills having plenty of work, with a fair demand for additional tonnages at about 1.93½c. Steel Bars, while nominally lower than Refined Iron, cost about the same money for prompt shipment.

**Sheets.**—There is no falling off in the demand for Sheets, and there is considerable pressure on the mills for prompt shipments. Prices, however, are unchanged as last quoted for mill shipments, and a tenth additional for smaller quantities: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

**Old Material.**—The market is somewhat irregular, but on the average prices are about as they were last week. Some sales of Steel Scrap are reported at a higher figure than we quote, but \$18.50 to \$18.75 seems to be the full limit which consumers are willing to pay. Bids and offers for material delivered in buyers' yards are about as follows:

Steel Crops and Rails.....	\$18.75 to \$19.00
No. 1 Steel Scrap.....	18.50 to 18.75
Low Phosphorus.....	22.75 to 23.25
Old Steel Axles.....	21.50 to 22.00
Old Iron Axles.....	31.00 to 32.00
Old Iron Rails.....	27.00 to 27.50
Old Car Wheels.....	22.50 to 23.00
Choice No. 1 R. R. Wrought.....	21.50 to 22.50
No. 1 Yard Scrap.....	19.50 to 20.50
Long and Short.....	18.50 to 19.00
Machinery Scrap.....	22.00 to 22.50
Wrought Iron Pipe.....	16.00 to 16.50
No. 1 Forge Fire Scrap.....	16.75 to 17.25
No. 2 Light.....	11.75 to 12.00
Wrought Turnings.....	16.00 to 16.50
Axle Turnings.....	17.00 to 17.50
Stove Plate.....	16.50 to 17.00
Cast Borings.....	14.00 to 14.50
Grate Bars.....	15.50 to 16.00

## Cincinnati.

FIFTH AND MAIN STS., February 6, 1907.—(By Telegraph.)

**Pig Iron.**—The general tendency of the market continues strong, with no weak spots discernible. There has been considerable buying for current delivery in a small way at ruling prices, \$23, Birmingham, apparently representing the minimum. A fair tonnage of Malleable has been sold, particularly for the last half, although there is an apparent demand for the second quarter for this grade, as indicated by inquiries received. There was one sale of 2400 tons of Charcoal Iron to an Ohio concern for Malleable purposes for delivery over last half which is said to have gone at about \$23, Lake Superior furnace. There is an inquiry in the market from this same concern for 2000 to 2800 tons of Foundry grades, embracing all Northern or half Northern and Southern, delivery running from June to November. A melter in Michigan is asking for 6000 tons of Malleable, shipment to cover July, August and September. There is an inquiry from Western territory for about 4000 tons of the same grade and delivery. The Southern situation is practically unchanged, showing very little improvement in the way of car supply. The anticipated change of freight rates on Iron from this section was deferred at the last minute

and moved up one month later, or until March 3. This will give the railroads an opportunity to reduce the tonnage of delayed freight on surface yards at the lower rate, which will be very satisfactory to all concerned. Southern No. 2 is quotable for last half from \$18.50 to \$19, with practically all of the business being taken at the minimum figure. Other deliveries are unchanged. Freight rates from the Hanging Rock District to Cincinnati are \$1.15, and from Birmingham, \$3. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$26.50 to \$27.00
Southern Coke, No. 2.....	26.00 to 26.50
Southern Coke, No. 3.....	25.50 to 26.00
Southern Coke, No. 4.....	25.00 to 25.50
Southern Coke, No. 1 Soft.....	26.50 to 27.00
Southern Coke, No. 2 Soft.....	26.00 to 26.50
Southern Coke, Gray Forge.....	23.00 to 23.50
Southern Coke, Mottled.....	22.00 to 22.50
Ohio Silvery, 8 per cent. Silicon.....	31.15 to 31.85
Lake Superior Coke, No. 1.....	26.65 to 27.15
Lake Superior Coke, No. 2.....	26.15 to 26.65
Lake Superior Coke, No. 3.....	25.65 to 26.15

#### Car Wheel Irons.

Standard Southern Car Wheel.....	\$29.00 to \$29.50
Lake Superior Car Wheel.....	27.50 to 28.00

**Coke.**—The market is quiet, with prices firm and contract shipments moving with a fair degree of regularity. We quote best grades of Connellsville and Virginia Foundry from \$4 to \$4.50 f.o.b. ovens.

**Finished Iron and Steel.**—Agents report that they are well sold up on Plates and Bars until July 1, and it is difficult to place orders for delivery prior to this date. Prices are holding strong and are unchanged. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.93c., with half extras; the same, in smaller lots, 2.10c., with full extras; Steel Bars, in carload lots, 1.73c., with half extras; the same, in smaller lots, 1.95c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-in. and heavier, 1.83c., in carload lots; in smaller lots, 2c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, 1 x ¼ in. or heavier, 1.93c., in carload lots.

**Old Material.**—The market is fairly active and prices are about the same as last week. We quote dealers' prices, f.o.b. Cincinnati, as follows

No. 1 R. R. Wrought, net ton.....	\$17.75 to \$18.25
Cast Borings, net ton.....	9.50 to 9.75
Steel Turnings, net ton.....	11.75 to 12.75
No. 1 Cast Scrap, net ton.....	16.75 to 17.75
Old Iron Axles, net ton.....	26.75 to 27.75
Old Iron Rails, gross ton.....	27.00 to 27.50
Old Steel Rails, long, gross ton.....	19.25 to 20.25
Relaying Rails, 56 lb. and up, gross ton.....	28.75 to \$29.75
Old Car Wheels, gross ton.....	22.75 to 23.25
Low Phosphorus Scrap, gross ton.....	21.25 to 21.75

## Cleveland.

CLEVELAND, OHIO, February 5, 1907.

**Iron Ore.**—Quite a number of inquiries for spot Ore or for delivery before the opening of navigation have been made the past week, and some small sales were made by interests that had more Ore of certain grades on the docks than they expected to need. The sales were made at the 1907 prices. Taken altogether, the market is quiet and not much activity is expected until navigation opens. While nearly the expected output of high grade Ores in 1907 has been sold, there is still some Mesaba non-Bessemer on the market. The low phosphorous Siliceous Ores are said to have been pretty well sold. Ore is moving rapidly from the Lake Erie docks in spite of the cold weather, which interferes with the loading, and the dock managers are complaining that they have more orders for shipment than they can care for at the present time. Reports from the ranges indicate an unusual amount of activity for the winter season, and local dealers are confident that former predictions of a record breaking year in the output of Ore will prove true. Quotations at Lake Erie docks are as follows: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.25; Mesaba non-Bessemer, \$4; Siliceous Bessemer, \$2.75; Siliceous non-Bessemer, \$2.50.

**Pig Iron.**—The market is quiet, but prices are very firm. The lull that followed the recent heavy buying movement for the last half still continues to a certain extent, although considerable tonnage of Northern Foundry for the third quarter and second half was disposed of in small lots the past week. More Pig Iron was sold in this territory during January than in any previous month for some time. For Northern Foundry No. 2 for second half delivery \$22 now seems to be the established Valley price, and no Iron is being offered at a lower price than that. A little better price is asked for the third quarter. Some furnaces want \$23 for the third quarter, Valley furnace, and others are asking that price for the last half. According to conservative estimates 60 per cent. of the output of the furnaces in this territory has been sold for the last half, and some dealers place the amount sold at 80 per cent. and even higher. Most of the

consumers in this territory have pretty well covered for the last half. Some of the big Eastern foundries and the Pipe and Pump makers are said to have made no purchases yet for the last half, and some Eastern inquiries were made in the local market during the week. A lively demand for spot No. 2 Foundry Iron has developed, and quite a number of sales in small lots have been made at \$25 at furnace. Few furnaces, however, are able to furnish spot Iron. A few inquiries were made for Basic Iron, but consumers are holding off. Furnaces are quoting Basic at \$21 to \$21.50 Valley, for the last half. Some sales of Bessemer were made at \$22, Valley furnace, for the third quarter. The demand for Southern Iron is a little more active, quite a number of sales of Foundry No. 2 having been made during the week in small lots for last half delivery. The price remains unchanged at \$18.50 to \$19, Birmingham, for last half. Dealers are still quoting foreign Iron at \$26, Cleveland, to be delivered about March 1, but no further sales are reported. Quotations for the last half 1907, f.o.b. Cleveland, are as follows:

Bessemer.....	\$21.50 to \$22.00
Northern Foundry, No. 1.....	22.50 to 23.00
Northern Foundry, No. 2.....	22.00 to 22.50
Northern Foundry, No. 3.....	21.50 to 22.00
Southern Foundry, No. 2.....	22.85 to 23.35
Gray Forge.....	21.00 to 21.50

**Coke.**—The market for Foundry Coke is quiet and the price is weaker. Foundry Coke is selling at \$4 at oven for first half and prompt shipment. Furnace Coke is very strong and is quoted at from \$3.65 to \$3.75 at oven. A good tonnage has been sold the past week at the former price, and one sale was made at the higher figure.

**Finished Iron and Steel.**—The buying movement has improved, considerable tonnage having been contracted for in the local market the past week for last half delivery. Among the orders booked was a good sized one for Plates and another for 3000 tons of bridge Structural Steel. Specifications are still coming in quite heavily. The heavier buying movement seems to be general. The orders are for the most part small ones, but in the aggregate they represent considerable tonnage. Prices in all lines remain firm and stationary. The heaviest demand during the week was for Bars and Plates. The mills took many new orders for Steel Bars for the last half and for Iron Bars for the second quarter. Bar deliveries are a little worse, if anything. Deliveries in Steel Bars cannot be secured within 8 to 10 weeks, and it takes a longer period to get Iron Bars. Some Western mills are shading prices a little and are selling Iron Bars in the local market on the basis of 1.75c. to 1.80c., Pittsburgh. The Pittsburgh quotation, 1.60c., is being held firmly on Steel Bars. Local warehouses are getting 1.95c. for Iron Bars and 1.95c. to 2c. for Steel Bars, both half extras, for immediate delivery. Specifications for Steel Bars are coming in quite heavily. The mills are asking 1.80c., Pittsburgh, for Plates for future delivery. One mill, however, that advanced the price to 2.10c., Pittsburgh, for reasonably prompt shipment, is booking some orders at that price. Structural Material shows considerable improvement, although the mills are not crowded with orders. Some Structural orders are being taken for last half delivery. The mills are holding 1.70c., Pittsburgh, as the base price for Beams, Angles and Channels. The demand for Sheets is still heavy, and some consumers are specifying three and four months ahead in order to get their orders filled. Local stock prices on Sheets remained unchanged from a week ago. They are: Blue Annealed, No. 10, 2.30c.; No. 28 One Pass Cold Rolled, 2.90c.; No. 28 Galvanized, 4c. As the result of slow deliveries local jobbers report a heavy demand for all kinds of Finished Iron and Steel for prompt shipment out of stock, in many cases carload lots being sold at warehouse prices.

**Old Material.**—The market is very weak and prices generally have declined 50c. a ton the past week. There are no indications of an improvement, and a further drop is expected before conditions begin to improve. Consumers have bought pretty well ahead and they show no disposition to make further purchases until their present supplies run short. There is a little selling for the third quarter, but at prices about \$1 a ton below the present prices. The following are dealers' prices to the trade per gross ton, f.o.b. Cleveland:

Old Steel Rails.....	\$17.50 to \$18.00
Old Iron Rails.....	23.50 to 24.50
Steel Car Axles.....	21.00 to 21.50
Old Car Wheels.....	21.00 to 21.50
Heavy Melting Steel.....	16.00 to 16.75
Railroad Malleable.....	17.50
Agricultural Malleable.....	15.50
Light Bundled Sheet Scrap.....	16.00 to 17.00
Bundled Tin Scrap.....	15.00 to 16.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles.....	\$29.25 to \$29.75
Cast Borings.....	9.50 to 10.00
Iron and Steel Turnings and Drillings.....	11.50 to 12.00
No. 1 Busheling.....	15.50
No. 1 Railroad Wrought.....	17.50 to 18.00
No. 1 Cast.....	17.00 to 18.00
Stove Plate.....	13.75 to 14.25



## Pittsburgh.

PARK BUILDING, February 6, 1907.—(By Telegraph.)

**Pig Iron.**—We note quite an active demand for Malleable Bessemer and Basic Iron for second quarter and also for delivery over last half, considerable tonnage having been sold in the past week. The Jones & Laughlin Steel Company, which has several furnaces idle for repairs, has made a deal for a considerable tonnage of Bessemer Iron to tide it over until these idle furnaces have been started. The McCrum-Howell Company, with plants at Norwich, Conn., and Uniontown, Pa., has bought 7000 to 8000 tons of Bessemer and Southern Foundry Iron for delivery in the last half of the year, while a local consumer has bought upward of 10,000 tons of Foundry Iron, mostly Southern, for delivery over the last half. We note sales of 3000 tons of Bessemer Iron, shipments commencing February, at \$22; also 2000 tons of Bessemer for second quarter at \$22.50, and 1500 tons of Basic for prompt delivery at \$22, Valley furnace; also a sale of 500 tons of Chilled Bessemer Iron for spot delivery at \$23, and 1000 tons of Northern Forge Iron for February and March delivery at \$21.40, Valley furnace, or \$22.35, Pittsburgh. There is not much inquiry for Forge Iron, but the market is fairly steady. We quote Bessemer, Malleable Bessemer and Basic Iron for delivery this side of July at \$22, Valley furnace, and at \$21 to \$21.50 for third and fourth quarter delivery. We quote Northern No. 2 Foundry Iron for spot delivery at \$24.50 to \$25, and for second quarter delivery at \$23 to \$24, Valley furnace.

**Steel.**—There is a fair amount of new inquiry for Billets and Sheet and Tin Bars, and while the supply of Steel is better prices are firm. We quote Bessemer Billets at \$29.50 to \$30, and Open Hearth \$31.50 to \$32, Pittsburgh. We quote Sheet and Tin Bars in random lengths at \$30, f.o.b. mill, Pittsburgh or Youngstown.

(By Mail.)

Quite a heavy inquiry is noted for Malleable Bessemer and Basic Iron for shipment in the second quarter and last half of the year. There is also some inquiry for Bessemer Iron, prices on which are fairly strong on the basis of \$22, Valley furnace, for shipment this side of July. While the supply of Billets and Sheet and Tin Bars is somewhat better, prices continue firm. The volume of business in Finished Iron and Steel continues heavy, especially in Plates, while the mills making Sheets and Tin Plate have an enormous tonnage on their books for delivery up to July. Ferromanganese is weak, and Scrap also continues dull and weak. There is a scarcity of Furnace Coke for prompt delivery, and it brings high prices.

**Ferromanganese.**—Reports that a local consumer has bought 5000 tons for forward delivery are denied. It is understood that foreign 80 per cent., in large lots and for future delivery, has been offered as low as \$70, Pittsburgh, and declined. For prompt delivery 80 per cent. is held at about \$73 to \$75, Baltimore, or \$75 to \$77, Pittsburgh. We note a sale of about 50 tons for spot delivery at the latter price.

**Muck Bar.**—There is a good deal of inquiry, and the supply is limited. We quote best grades, made from all Pig Iron at \$36 to \$37, Pittsburgh, while Bar made from part Scrap is held at \$33 to \$34, Pittsburgh.

**Rods.**—The available supply continues very limited, and we quote Bessemer Rods at \$37 to \$38, and Open Hearth about \$39, Pittsburgh.

**Skelp.**—The market continues very firm, and there is a good deal of inquiry. Some of the Eastern mills report having sold Iron Skelp, Grooved sizes, on the basis of 2.10c., Pittsburgh. We quote: Grooved Steel Skelp, 1.80c. to 1.85c.; Sheared Steel Skelp, 1.90c. to 2c.; Grooved Iron Skelp, 2.05c. to 2.10c.; Sheared Iron Skelp, 2.20c. to 2.30c., f.o.b. Pittsburgh.

**Steel Rails.**—The amount of actual tonnage being placed in Steel Rails is disappointing. This is probably due to the fact that many of the railroads and traction lines find it difficult at present to market their securities and do not have the money to place orders for equipment. This condition is probably only temporary and will disappear when the money market becomes easier. The Carnegie Steel Company took orders in the past week for about 13,000 tons of Steam Rails. There is a good inquiry for Light Rails, but the Carnegie Company is not in position to take contracts for delivery before July. We quote Light Rails as follows: \$33 to \$34 for 20 to 45 lb.; \$34 to \$35 for 16-lb., and \$35 to \$36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at \$28, at mill.

**Structural Material.**—The American Bridge Company has recently booked 6000 to 7000 tons for subsidiary interests of the Steel Corporation which are making additions to their plants, and has also taken considerable other tonnage. The McClintic-Marshall Construction Company has taken about 1000 tons for new buildings for the Standard Steel Car Company at Butler, Pa., and also about 1500 tons for a bridge across the Potomac River for the Norfolk & Western. There is a good deal of inquiry, and considerable

work is in sight which is expected to be placed before long. Prices are firm, and we quote: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x ¼ in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card, Angles, Channels and Tees under 3-in. are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

**Plates.**—The tonnage of Plates entered by the leading mills in January was enormously heavy, and with some mills broke all previous records for orders entered in one month. The leading mills are sold up for four to five months ahead, and will only take business for indefinite delivery. Premiums of \$1 to \$2 a ton over regular prices are being paid for Plates for prompt shipment. For indefinite delivery leading mills quote as follows: Tank Plate, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

Extra per 100 lb.

Gauges lighter than ¼-in. to and including 3-16-in.	
Plates on thin edges.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 in.....	.05
Plates over 110 to 115 in.....	.10
Plates over 115 to 120 in.....	.15
Plates over 120 to 125 in.....	.25
Plates over 125 to 130 in.....	.50
Plates over 130 in.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Firebox Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Shell Grade of Steel is abandoned.	

**TERMS.**—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of ¼ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

**Sheets.**—The volume of new business is large and the leading mills have their output sold up for the next three or four months, and we are advised that in some cases present contracts call for delivery as far ahead as the last half of this year. The recent advance in prices of Box Annealed and Galvanized Sheets is being firmly held, and we quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, \$3.25 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

**Hoops and Bands.**—Consumers covered requirements some time ago and are specifying liberally on these contracts. Prices are firm, as follows: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

**Tin Plate.**—We are advised that there is a good deal of inquiry for delivery in the third quarter, and that on account of high prices for Tin Bars and Pig Tin the mills are readily obtaining a premium of not less than 10c. a box over regular prices on Tin Plate for shipment in third quarter. The leading interest has a heavy tonnage on its books, and this is also true of the independent mills. We quote \$3.90 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

**Iron and Steel Bars.**—New business continues heavy, and with the large contracts now on the books of the mills they are assured of full operation for some months to come. The bad weather of the last two weeks has interfered materially with shipments, and the mills are not catching up on deliveries. The two leading interests in the Steel Bar trade, these being the Carnegie and Jones & Laughlin companies, are sold up to July 1 or longer. We quote Refined Iron Bars at 1.80c., Pittsburgh, and Steel Bars at 1.60c., base, half extras, f.o.b. Pittsburgh, these prices being for forward delivery. For prompt shipment premiums of \$1 and \$2 a ton are asked.

**Railroad Spikes.**—The heavy demand is maintained, and the makers of Spikes have enough tonnage on their books to take practically their entire output up to July 1. We quote \$2.40 to \$2.50 per 100 lb. for forward delivery, while for prompt shipment \$2.65 to \$2.75 is quoted.

**Merchant Steel.**—Specifications on contracts are large, and a fair amount of new business is being placed. The mills are well sold up to July 1, and are still much behind in deliveries. Prices continue firm, and we quote: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c., for ordinary grades, and 10c. and upward for special grades. The demand for Shafting is reported active, and prices are fairly well maintained. We quote Cold Rolled Shafting at 50 per cent. off in carloads, and 45 per cent. in less than carloads, delivered in base territory.

**Spelter.**—For spot shipment, the prime grades of Western Spelter are held at about 6.75c., St. Louis, equal to 6.87½c., Pittsburgh. For forward delivery about 6.65c., St. Louis, is quoted.

**Pipes and Tubes.**—The inquiry of the Philadelphia Company for about 4000 tons of Merchant Pipe, Steel Pipe and Casing, to be all Iron, has been placed, the business being divided between several mills. The Texas Company is in the market for 10 miles of 8-in. Wrought Iron Line Pipe and a considerable tonnage of smaller sizes. The present demand for tubular goods of all kinds is simply unprecedented, and all the leading mills have their product well sold up to July 1. Shipments are much delayed, some of the mills not being able to give customers more than half of the tonnage they want. The whole market is extremely firm, and, with the enormous demand and the higher prices being charged by the mills for Plates, it is not improbable that another advance in prices of Pipe may be made before long. We note that an advance in prices of Iron Pipe has gone into effect, the extreme discount on Merchant sizes of Iron Pipe now being 70 and 5 per cent. off for ¾ to 6 in., and on Steel Pipe, 76 and 5 per cent. off, for carload lots to the large trade. Official discounts on Steel Pipe, which are shaded about one point or more to the large trade, are as follows:

Merchant Pipe.	Jobbers, carloads.	
	Black.	Galv.
¾ to 1½ in.	67	51
1½ in.	69	55
1½ in.	71	59
2 to 6 in.	75	65
7 to 12 in.	70	55
Extra strong, plain ends:		
¾ to 1½ in.	60	48
1½ to 4 in.	67	55
4½ to 8 in.	63	51
Double extra strong, plain ends:		
¾ to 8 in.	56	45

Official discounts on Iron Pipe, which are shaded one point or more to the large trade, are as follows, f.o.b. Pittsburgh:

Standard Genuine Iron Pipe.	Black.		Galvanized.	
	Per cent.		Per cent.	
¾ to 6 in.	69 and 5		59 and 5	
1½ in.	64 and 5		52 and 5	
2 in.	62 and 5		44 and 5	
2½ and 3 in.	60 and 5		44 and 5	
7 to 12 in.	64 and 5		49 and 5	
Extra Heavy Iron Pipe, Plain Ends.				
1½, 2 and 3 in.	64 and 5		42 and 5	
3½ to 4 in.	61 and 5		49 and 5	
4½ to 8 in.	57 and 5		44 and 5	

**Boiler Tubes.**—We note an extremely active demand for both Locomotive and Merchant Tubes, which is referred to as being heavier now than before the recent advance in prices was made. Locomotive shops are placing large orders, while the demand for Merchant Tubes is also heavy. Discounts are as follows:

Boiler Tubes.	Iron.		Steel.	
1 to 1½ in.	41		47	
1½ to 2½ in.	42		59	
2½ in.	47		61	
2½ to 5 in.	54		67	
6 to 13 in.	42		59	

**Iron and Steel Scrap.**—As yet there has been no improvement in the demand, while prices continue somewhat weak, consumers refusing to buy ahead, believing that the bottom of the market has not yet been reached. A fair tonnage of Scrap is moving, but mostly for February delivery. We quote as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise stated: Heavy Melting Scrap, \$18.25, for Pittsburgh, Steubenville or Sharon delivery; Old Steel Rails, short pieces, for Open Hearth purposes, \$18.25; Old Steel Rails, rerollers, \$19.50 to \$20; Wrought Iron Turnings, \$14.25; No. 1 Wrought Scrap, \$19.50 to \$19.75; No. 2 Wrought Scrap, \$17.75 to \$18. Bundled Sheet Scrap is weak and is held at about \$16 to \$16.25. Tin and Terne Plate Clippings are \$18.50 to \$19 per net ton. Low Phosphorous Melting Stock is weak and is held at about \$22, but on a firm offer this price would be shaded. Cast Iron Borings are \$12.25; Old Car Wheels, \$21.50 to \$22; Steel Axles, \$21.50. Quite a good demand is seen for Cast Scrap, and sales of about 1500 tons of Cast Scrap on the basis of

about \$20, Pittsburgh, have been made for forward delivery. Grate Bars are scarce and firm at about \$15, while Stove Plate is quoted at \$15.50 to \$16. Sales have been made of 800 tons of Heavy Axle Borings at \$18.25, Pittsburgh, and about 500 tons of Stove Plate at about \$16, Pittsburgh.

**Coke.**—The supply of strictly Connellsville Furnace Coke for delivery up to July 1 is pretty well under contract, with the result that it is scarce and brings high prices. We quote strictly Connellsville Furnace Coke for prompt shipment at \$3.50 to \$3.65, some sellers refusing to sell at less than the higher price. Connellsville 72-hr. Foundry Coke for prompt delivery is also scarce, and brings \$4.25 to \$4.50 a ton at oven. Connellsville Furnace Coke, on contracts up to July delivery is about \$3.25, and 72-hr. Foundry \$4 to \$4.25, at oven. Outside makes of Coke, which do not run as high in quality as strictly Connellsville, are offered at somewhat lower prices. The output is heavy, the Upper and Lower Connellsville regions having made last week about 405,000 tons. The heavy snows and cold weather of the past two weeks have retarded the movement of cars and interfered with shipments to some extent.

The downtown offices of the McClintic-Marshall Construction Company have been removed from room 811 to rooms 1212-1214 Park Building, Pittsburgh.

## Birmingham.

BIRMINGHAM, ALA., February 3, 1907.

**Pig Iron.**—So far as prices for the second half are concerned there is no apparent change, but as the car situation improves there is a tendency on part of the furnace people to ease up on the price of spot Iron and for nearby deliveries. One large interest, which makes one of the leading brands of the district, is now openly quoting \$21.50 for No. 2 Soft for February and March delivery. During the latter part of last year practically all the furnaces here had contracts covering their entire outputs for that delivery, and as a consequence the one or two concerns which had Iron to sell secured fancy prices. This year nearly all the furnaces reserved a certain amount to sell as spot Iron, resulting in more being held back than was necessary, and as melters are now securing contract Iron more regularly, the demand is nothing like so urgent for spot. As a result, prices have declined from a maximum of \$25, six weeks ago, to a minimum of \$21.50 to-day. As the transportation situation improves, it is but logical to conclude that there will be still further concessions. That the car situation is gradually improving cannot be denied. The open winter has not served to block traffic as in years gone by, and while there have been unprecedented delays on account of lack of locomotive power on all of the Southern roads, with the crops now out of the way much relief may soon be expected. New engines have also been purchased, and old ones transferred from other diversions to this district, and it is promised that the situation will be greatly improved without further delay. Soliciting freight agents are again looking for business, something which they have not been doing for months. The protests of the Southern Iron producers, together with those from manufacturers' associations and foundrymen all over the United States, have caused the Southern Railroads to reconsider the proposed advance of 25c. per ton in freight rates which was scheduled to go into effect February 1. It is now stated this rate will go into effect March 3.

**Cast Iron Pipe.**—Nothing of importance has transpired in the Water and Gas Pipe market this week. The usual number of small orders are still being received, and these in the aggregate amount to a considerable tonnage. During the past week the prices of Cast Iron Soil Pipe were advanced as follows: Standard Pipe, 5 per cent.; Extra Heavy Pipe, 10 per cent.; Fittings, from 5 to 15 per cent. The demand for this material was never better, with foundries far behind with deliveries and no stocks in their yards. Quotations on Water Pipe remain unchanged and are approximately as follows: 4 to 6 in., \$35; 8 to 12 in., \$33; over 12 in., average \$30, with \$1 per ton extra for Gas Pipe.

**Old Material.**—The Scrap market remains inactive, although the prices ruling last week are still being maintained, with the exception of No. 1 Machinery Cast, which has declined about 50c. per ton in sympathy with the weakening in price of spot Pig Iron. Quotations are approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails	\$22.00 to \$22.50
Old Iron Axles	19.50 to 20.00
Old Steel Axles	17.50 to 18.50
Old Car Wheels	19.50 to 20.00
No. 1 Railroad Wrought	20.00 to 20.50
No. 2 Railroad Wrought	15.50 to 16.00
No. 1 Country Wrought	15.50 to 16.00
No. 2 Country Wrought	12.50 to 13.00
Wrought Pipe and Flues	13.00 to 13.50
Railroad Malleable	14.00 to 14.50
No. 1 Steel	15.00 to 15.50
No. 1 Machinery Cast	15.50 to 16.00
Stove Plate and Light Cast	12.00 to 12.50
Cast Borings	8.75 to 9.25



## New York.

NEW YORK, February 6, 1907.

**Pig Iron.**—There is comparatively little inquiry, either for spot or for distant delivery. One interest which has one foundry in Connecticut and another in western Pennsylvania has bought 2300 tons for the former and 6800 tons for the latter. A large pump company is calling for 1000 tons. We quote spot Northern Iron, in small lots, \$25.50 to \$26.50 for No. 1 X, and \$24.50 to \$25 for No. 2 Foundry. For the first half we quote \$25.50 to \$26 for No. 1 Foundry, \$24 to \$25 for No. 2 Foundry and \$23.50 to \$24 for No. 2 Plain. For the second half we quote \$23.50 to \$24 for No. 2 Foundry. No. 2 Middlesbrough is \$21.50 to \$22 on dock, and Scotch, \$24.50 to \$25, on dock.

**Steel Rails.**—Trolley line business continues to be a factor. In the past week 7000 tons was sold to an electric road in Utah, and a line in Washington bought 1000 tons. Miscellaneous sales amounted to 4000 or 5000 tons. An inquiry has come from the Council City & Solomon River Railroad Company, 5 Nassau street, for 10,500 tons, to be laid in the Seward Peninsula of Alaska. The Hudson Companies are in the market for 600 tons of Open Hearth Rails for their four tubes under North River.

**Structural Material.**—Though January was regarded as a quiet month, it is estimated that the bridge companies have closed upward of 90,000 tons of Steel work for bridges and buildings since the first of the year, railroad bridge work amounting to 32,000 tons. The American Bridge Company's January business amounted to 52,000 tons, the largest single contract being 15,000 tons for the Corn Products Company's new construction. In the past week several small jobs have been given out at San Francisco, three of these, taken by the American Bridge Company, amounting to something less than 1000 tons. Among bridge contracts not heretofore mentioned are 3000 tons for the Norfolk & Western, 1400 tons for the Delaware & Hudson, and 1000 tons for the Union Railroad at Pittsburgh. Competition for work continues strong and the increase in fabricating capacity in the past two years is temporarily more in evidence, the various bridge companies showing some eagerness to get work that is actually to be put through, since there is uncertainty about a good many projects talked of for this year, and the bridge programmes of some of the railroad engineering staffs may not be finally approved. The mills find a continuance of the good specifying of the past two or three weeks. We continue our quotations on mill shipments, tidewater deliveries, as follows: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.90½c. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10c. Sales out of stock of material cut to length are at 2¼c. to 2½c.

**Bars.**—Inquiries for Bar Iron have been numerous, and some sales of good sized quantities have been made for deliveries running over the next 60 to 90 days. Prices are well maintained at 1.84½c. to 1.89½c., tidewater. Steel Bar mills are unable to make delivery as early as the Bar Iron mills, consequently the lower price quoted on Steel Bars is not so attractive to those who desire reasonably early supplies. Quotations on Steel Bars range from 1.74½c. to 1.84½c., tidewater, according to specifications, time of delivery, &c.

**Plates.**—The local inquiry is rather light, as consumers of Plates in this vicinity are not as busy as some time since and their requirements are therefore smaller. The range of quotations, tidewater delivery, taking the low price on long deliveries of Western mills and the rate made by Eastern mills, is as follows: Sheared Tank Plates, 1.84½c. to 2.14½c.; Flange Plates, 1.94½c. to 2.24½c.; Marine Plates, 2.24½c. to 2.44½c.; Firebox Plates, 2.75c. to 3.50c., according to specifications.

**Cast Iron Pipe.**—Inquiries are becoming better instead of falling off, although a slackening of interest in the market has been expected in view of the high prices now prevailing. The Pennsylvania inquiries are particularly promising, and come largely from private companies. The tonnage in sight in that direction runs up into a large aggregate. Atlantic City is expected to be in the market shortly for 6000 to 7000 tons. New York City will open bids today for 2300 tons, Newark on 1250 tons to-morrow and Yonkers, on the same day, on 500 tons. The great majority of foundries are well supplied with work, and maintaining quotations on the basis of \$35 to \$36 for 6-in. Pipe per net ton at tidewater.

**Old Material.**—As predicted some time ago, many of those who sold Scrap for future delivery, taking their chances of being able to secure their supplies in the open market, have been called upon to deliver, and are finding only small quantities available. The market here has been scoured quite thoroughly, and in several instances these buyers have paid as much as they are to receive on their contracts, and in some cases have given 25c. per ton more. This applies particularly to Heavy Melting Steel Scrap, of which the local market has possibly never had so little to ship. The prospects of securing much of a supply for the next few weeks are rather slim, as the heavy snow which

has fallen through the country quite generally will prevent the railroads from gathering much Scrap. It would seem as if higher prices on this class of material were to be expected. Heavy Cast Scrap, Stove Plate, Cast Borings and Heavy Turnings have been in excellent demand, and prices are strong. Prices of Wrought Scrap are keeping up remarkably well. Quotations per gross ton, f.o.b. New York, are as follows:

Old Girder and T-Rails for Melting....	\$16.25 to \$16.75
Heavy Melting Steel Scrap.....	16.25 to 16.75
Old Steel Rails, rerolling lengths.....	19.50 to 20.00
Relaying Rails.....	28.00 to 29.00
Old Iron Rails.....	24.00 to 25.00
Standard Hammered Iron Car Axles....	28.50 to 29.50
Old Steel Car Axles.....	21.00 to 22.00
No. 1 Railroad Wrought.....	21.00 to 21.50
Iron Track Scrap.....	18.00 to 18.50
No. 1 Yard Wrought, long.....	18.50 to 19.00
No. 1 Yard Wrought, short.....	17.50 to 18.00
Wrought Pipe.....	14.50 to 15.00
Light Iron.....	11.00 to 11.50
Cast Borings.....	12.00 to 12.50
Wrought Turnings.....	14.50 to 15.00
Old Car Wheels.....	22.50 to 23.00
No. 1 Heavy Cast, broken up.....	19.00 to 20.00
Stove Plate.....	16.00 to 16.50
Grate Bars.....	14.00 to 14.50
Malleable Cast.....	18.00 to 19.00

## Metal Market.

NEW YORK, February 6, 1907.

**Pig Tin.**—The statistics issued February 1 were about the same as expected by those well informed in the trade. The total visible supply at the end of January was 13,462 net tons, an increase of 464 tons as compared with the end of the previous month and a decrease of 824 tons compared with the end of January, 1906. The deliveries into consumption in the United States were large, amounting to 3950 tons, and the stocks amounted to 1640 tons, showing a decrease of 482 tons compared with the end of December. This evidently stimulated an advance, as while on January 31 a good business was done at 41.85c., on February 1 transactions fell off slightly and the price advanced to 42.25c. On the 4th a further advance was made to 42.50c., and the volume of business was further contracted. To-day's price is unchanged at 42.50c. There has been a noticeable increase in the demand for London shipments two or three weeks from date, and some of this business was closed Thursday at 41.65c. There is no disguising the fact that stocks in this country are low, as the arrivals so far this month are but 125 tons. These supplies are concentrated in strong hands. The Tin to arrive, which amounts to 2365 tons, is for the most part to be delivered during the latter part of this month or the first of next, and a large portion of that which will arrive before the 15th is already sold to consumers. It would therefore seem that prices for the greater portion of February will be firm. No little difficulty is being experienced by consumers in securing metal promptly. For the first time this year reports of delays in shipments are becoming numerous, and one authentic instance is mentioned where a carload of Tin laid on the dock for several days, and it was finally a week before it was shipped to the interior. With the storm which occurred this week seriously hampering trucking in this city these delays are more liable to grow greater than less. The London market closes quiet to-day at £193 for spot and £192 5s. for futures.

**Copper.**—The Copper market continues exceedingly firm, but buying has been confined to small lots, which have gone at relatively high prices. For future deliveries of Lake 25c. to 25.25c. is quoted, Electrolytic 24.75c. to 25.25c., while Casting Grades are unchanged at 24.50c. to 25c. Premiums above these prices continue to be paid. For strictly spot stocks it is stated that European buyers of Lake and Electrolytic are obliged to pay 25.25c. for their supplies. We learn of at least one sale, which was made well above 25c., but it was purchased from second hands in order to secure prompt delivery. Cask lots of Lake are held at 26c., Electrolytic at 25.75c. There has been some Australian Copper offered in a retail way at under 25c., but as this is for shipment from Europe and is Australian Copper it excites no interest in the trade. The European markets are firm, London closing to-day at £107 12s. 6d. for spot, £108 17s. 6d. for futures and Best Selected is unchanged at £114. The exports of Copper during January amounted to 16,639 tons, an increase of 1332 tons compared with January, 1906. Figures are now available, which show that the total imports for 1906 amounted to 104,650 gross tons, against 94,280 tons in 1905. The December imports were 8350 tons. The exports during the first five days of this month were light, amounting to but 663 tons. The storms during the week have further hampered transportation of Copper, Mineral and Coke.

**Pig Lead.**—There is a quieter feeling in the Lead trade, although prices are unchanged. For spot deliveries 6.30c. to 6.35c. is quoted. Shipments can be had at 6.25c. to 6.27½c. The St. Louis market is steady at 6.10c. to 6.15c. The weather is interfering considerably with deliveries, but this is offset in a large measure by the lighter demands from

contractors. In London prices are unchanged at £19 12s. 6d. The American Smelting & Refining Company continues to accept orders at prices current on date of shipment, with a price of 6c. governing old contracts.

**Spelter.**—Considerable premiums are being paid for spot and nearby Spelter, and it is said that 7.25c. has been paid for carloads. Nearby shipments from the West, however, can be obtained at 7c., New York, and future deliveries at 6.90c. In St. Louis the supply is inadequate to the demand, prices ruling at 6.70c. to 6.75c. The receipts at St. Louis for the first month of the year show a decided increase as compared with the same month last year.

**Ferroalloys.**—The decline in Ferromanganese continues to attract attention, sales having been made at \$70, Baltimore, which is equivalent to about \$72, f.o.b. Pittsburgh. The price of Ferrosilicon is unchanged at \$110, f.o.b. Atlantic ports; in some quarters, however, a premium above this price is demanded.

**Antimony.**—Prices are considerably firmer, and although some of the smaller dealers continue to offer concessions, the general market is represented at 26c. for Cookson's, 25c. for Hallett's and 24c. to 25c. for other brands.

**Tin Plates.**—Operators for foreign account continue to shade prices, but domestic Tin Plates are very firm at \$3.90, f.o.b. Pittsburgh, and \$4.09, f.o.b. New York.

**Old Metals.**—There has been an advance in the selling prices of Old Metals, and although the general range is represented in the following list, there are some irregularities from these prices, depending on the needs of the consumer:

	Cents.
Copper, Heavy Cut and Crucible.....	23.50 to 24.50
Copper, Heavy and Wire.....	22.50 to 23.50
Copper, Light and Bottoms.....	21.00 to 22.00
Brass, Heavy.....	16.75 to 17.00
Brass, Light.....	13.75 to 14.00
Heavy Machine Composition.....	21.00 to 21.50
Clean Brass Turnings.....	15.00 to 15.50
Composition Turnings.....	18.00 to 18.50
Lead, Heavy.....	6.00
Tea Lead.....	5.70
Zinc Scrap.....	5.00

## Chicago.

FISHER BUILDING, February 6, 1907.—(By Telegraph.)

A canvass of market conditions governing finished products reveals no important change in any line, though in many departments deliveries are growing more and more retarded. This is notably true of Tubular goods and Light Sheets. No relaxation in the firmness of prices is noticed anywhere along the line, as mill order books at present seem too well filled to invite a degree of competitive selling strong enough to induce concessions. Of the heavier mill products Plates seem to be in strong demand, and prices above 1.70c., Pittsburgh, now ruling, are obtained on practically all business, save that for distant future deliveries. A disposition on the part of Southern furnaces generally to hold less rigidly for top prices is manifested in freer offerings at \$18.50, Birmingham, for No. 2 Foundry for last quarter, and this price is believed to represent the average holding for that period, though it is not unlikely that acceptable business through the entire second half can be placed at this figure. Lack of unanimity of opinion among furnacemen as to future market strength and the varying proportions of unsold schedules yet to be placed are responsible for some quotations up to \$19, Birmingham, for last quarter that are still being made. In response to appeals from producing and consuming interests Southern railroad lines have postponed the application of the proposed advance of 25c. to the Ohio River for another month, and it will therefore not be effective until March 3. The 20c. advance from the Ohio River north is now effective. As a result of this action, increased urgency of demand for shipment of overdue orders may be expected from consumers.

**Pig Iron.**—Present market indications point to a somewhat easier tone respecting last half holdings, which range from \$18.50 to \$19, Birmingham, for No. 2 Foundry, with more tonnage available at the former price than heretofore. Inquiries for extended deliveries have thus far this month not been up to the average of preceding weeks, though within a day or two more interest has developed. Foreign Irons have recently been offered in this market, but it is stated on good authority that no sales up to the present have been closed. The demand for spot Iron continues good, and is being supplied in part by consumers from deferred shipments of the last quarter of 1906 that in some cases are doubling with those of later date. No change is noted in early delivery prices for Southern No. 2 Foundry, which still holds firm at \$23, Birmingham, for first quarter and \$22 for second quarter. Lake Superior Charcoal is now quoted at \$26.50 for any delivery through the second half. Of the inquiry for 15,000 tons reported in the market last week approximately one-half is believed to have been placed. A large consuming interest will next week make a tentative inquiry for 25,000 tons, which will be placed if the market proves responsive to the buyer's views. Early deliveries still command prices within the range of the following schedule,

quotations for February and March shipments, f.o.b. Chicago, including the 45c. advance in freight rate, which is now deferred until March 3:

Lake Superior Charcoal.....	\$27.00 to \$27.50
Northern Coke Foundry, No. 1.....	26.00 to 26.50
Northern Coke Foundry, No. 2.....	25.50 to 26.00
Northern Coke Foundry, No. 3.....	25.00 to 25.50
Northern Scotch, No. 1.....	26.00 to 27.00
Ohio Strong Softeners, No. 1.....	26.00 to 26.50
Ohio Strong Softeners, No. 2.....	25.50 to 26.00
Southern Coke, No. 1.....	27.35 to 27.85
Southern Coke, No. 2.....	26.85 to 27.35
Southern Coke, No. 3.....	26.35 to 26.85
Southern Coke, No. 4.....	25.85 to 26.35
Southern Coke, No. 1 Soft.....	27.35 to 27.85
Southern Coke, No. 2 Soft.....	26.85 to 27.35
Southern Gray Forge.....	25.85 to 26.35
Southern Mottled.....	22.85 to 23.35
Malleable Bessemer.....	26.00 to 26.50
Standard Bessemer.....	25.30 to 25.80
Jackson Co. and Kentucky Silvery, 6 %	29.30 to 29.80
Jackson Co. and Kentucky Silvery, 8 %	31.30 to 31.80
Jackson Co. and Kentucky Silvery, 10 %	33.30 to 33.80

**Metals.**—With prices holding at about the same level and no radical change either in the character or quantity of purchases, conditions remain about as heretofore reported. There is the usual scarcity of Lake and Casting Copper, the demand for which exceeds the supply. We quote as follows: Casting Copper, 26½c. to 27c.; Lake, 27c. to 27½c., in car lots for prompt shipment; small lots, ¼c. to ¾c. higher; Pig Tin, car lots, 44½c.; small lots, 45c.; Lead, Desilverized, 6.50c. to 6.60c., for 50-ton lots; Corroding, 7.25c. to 7.35c., for 50-ton lots; on car lots, 2½c. per 100 lb. higher; Spelter, 6.90c.; Cookson's Antimony, 28½c., and other grades, 26½c. to 27½c.; Sheet Zinc is \$8.40 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 20½c.; Heavy Copper, 20¼c.; Copper Bottoms, 19½c.; Copper Clips, 20c.; Red Brass, 19½c.; Red Brass Borings, 16½c.; Yellow Brass, 16c.; Yellow Brass Borings, 14½c.; Light Brass, 12½c.; Lead Pipe, 5.50c.; Tea Lead, 5c.; Zinc, 5c.; Pewter, No. 1, 28c.; Tin Foil, 34c.; Block Tin Pipe, 27½c.

(By Mail. Delayed in Transmission.)

**Billets and Rods.**—Conditions as to supply and demand are unchanged. Quotations of \$36 to \$37, Pittsburgh, still apply on Rods, but continued scarcity at all points of supply restricts sales to small lots commanding a premium of from \$1 to \$2 per ton. Forging Billets are likewise scarce and continue to be quoted at \$38, with the usual advance according to size.

**Rails and Track Supplies.**—Track Supplies are in strong demand, and Spike prices have firmed up so that \$2.40 to \$2.50 is about bottom for deliveries ahead; more urgent requirements are 10c. to 15c. higher. Track Bolts are also advanced 10c. Recent transactions in Light Rails indicate firmness at prices quoted. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.90c.; Spikes, 2.40c. to 2.50c., according to delivery; Track Bolts, 2.75c. to 2.85c., base, Square Nuts, and 2.90c. to 3c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$33; 25-lb., \$34; 20-lb., \$35; 16-lb., \$36; 12-lb., \$37, f.o.b. mill. Standard Sections, \$28, f.o.b. mill, full freight to destination.

**Structural Material.**—No abatement is observed in the activity that has for several weeks characterized the operations of Structural mills. A fair volume of new business, with a free offering of specifications is reported. The American Bridge Company has closed contracts for the Shelby County Court House, Tennessee, 800 tons; Paulson Building, Spokane, Wash., 300 tons; Lehigh Valley Coal Company, South Chicago, 2000 tons. Specifications from the car building interests continue to furnish an increasingly large tonnage. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Tees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

**Plates.**—Anything like nearby deliveries commands prices in excess of the normal quotation of the leading interests, which is \$1.70, Pittsburgh. For any deliveries they can make mills in position to furnish Plates with reasonable promptness have no difficulty in getting \$2 to \$4 a ton above this price. Current orders from many sources swell the general volume, which is largely augmented by Steel car requirements. Revising prices, we quote for future deliveries as follows: Tank Plate, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.86½c. to 2.06½c.; 3-16-in., 1.96½c. to 2.16½c.; Nos. 7 and 8 gauge, 2.01½c. to 2.21½c.; No. 9, 2.11½c. to 2.31½c.; Flange quality, in widths up to 100 in., 1.96½c. to 2.06½c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.96½c. to 2.16½c.; Flange quality, 2.06½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 in. to 96 in. wide, 2.30c. to 2.40c.; 3-16-in., up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide,



2.55c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

**Sheets.**—No change is noted in the demand for Sheets, which continues unusually active. Specifications for all gauges and qualities are coming in without stint. New business is also being freely offered, and deliveries are not improved. Shipments of Galvanized, which have for some time been slow, are lagging further still behind, and are now extended from three to four months. A premium of \$1 or more a ton is frequently offered by users for prompt shipment. We quote as follows: Blue Annealed, No. 10, 2.01½c.; No. 12, 2.06½c.; No. 14, 2.11½c.; No. 16, 2.21½c.; Box Annealed, Nos. 17 to 21, 2.51½c.; Nos. 22 to 24, 2.56½c.; Nos. 25 and 26, 2.61½c.; No. 27, 2.66½c.; No. 28, 2.76½c.; No. 29, 2.86½c.; No. 30, 2.96½c.; Galvanized Sheets, Nos. 10 to 14, 2.81½c.; Nos. 15 and 16, 3.01½c.; Nos. 17 to 21, 3.16½c.; Nos. 22 to 24, 3.31½c.; Nos. 25 and 26, 3.51½c.; No. 27, 3.71½c.; No. 28, 3.91½c.; No. 30, 4.41½c. Sheets from store: Blue Annealed, No. 12, 2.30c.; No. 14, 2.35c.; No. 16, 2.45c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c. Galvanized from store: Nos. 10 to 20, 3.30c. to 3.35c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.75c. to 3.95c.; No. 28, 4.10c.; No. 30, 4.65c. to 4.70c.

**Bars.**—New contracts for large tonnages of Iron and Steel Bars are not in evidence, and are apparently not needed to sustain the firmness of the market, which is held strong by plentiful buying in smaller lots. Some of the mills whose capacities are well sold up for considerable time ahead are asking prices slightly in excess of present quotations, though for the general run of business prices remain unchanged. Quotations are as follows: Iron Bars, 1.81½c. to 1.86½c.; Steel Bars, 1.76½c., both half extras; Hoops, 2.16½c., extras as per Hoop card; Bands, 1.76½c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.86½c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

**Merchant Pipe.**—Instead of showing improvement, deliveries are falling still further behind, and the leading producers are crowding capacities in an effort to keep pace with accumulating orders. Discounts on car lots, Chicago, are as follows: Black Steel Pipe, 74.35 on the base sizes, ¼ to 5 in., and Galvanized, 64.35. From store in small lots, Chicago jobbers now quote 72½ per cent. on Black Steel Pipe, ¼ to 6 in. Iron Pipe is held in advance from four to five points above these prices.

**Boiler Tubes.**—Merchant Tubes are moving with more than reasonable activity, and smaller sizes for Railroad requirements are in unusually strong demand. Mill quotations are as follows on the base sizes: 2¼ to 5 in., in car-load lots, Steel Tubes, 65.35; Iron, 52.35; Seamless, 49.35; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	40	35	42½
1½ to 2¼ in.	50	35	35
2½ in.	52½	35	30
2½ to 5 in.	60	47½	42½
6 in. and larger.	50	35	..

**Merchant Steel.**—A generous supply of orders and specifications is reported by all mills. Conditions as to deliveries are, on the whole, not unsatisfactory, and no change in prices is reported. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.96½c.; Iron Finish, up to 1½ x ½ in., 1.91½c.; Iron Finish, 1½ x ½ in. and larger, 1.76½c., base; Channels for solid rubber Tires, ¾ to 1 in., 2.26½c., and 1½-in. and larger, 2.16½c.; Smooth Finished Machinery Steel, 2.16½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 2.06½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.31½c.; Railroad Spring, 1.96½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, in base territory.

**Cast Iron Pipe.**—There is apparently a lull in the movement of Cast Iron Pipe, so far as large tonnages are concerned, but the absence of such transactions finds compensation, in a measure, in the large number of orders ranging from 200 to 500 tons that are being received, which business represents activity in replacements and extensions. In view of the continued holding of Pig Iron prices, quotations are advanced approximately \$1 per ton of 2000 lb. We quote: Water Pipe, 4-in., \$38 to \$39; 6 to 12 in., \$37 to \$38; 16-in. and up, \$36 to \$37, with \$1 extra for Gas Pipe.

**Coke.**—Apprehensiveness on the part of buyers as to the results of present weather conditions on transportation facilities is due to a strong buying movement in small lots for prompt delivery. An unusual number of orders of this character have been received within the past few days. Prices are unchanged; Connellsville 72-hr. Coke is quoted at \$4.25 and \$4.50 per car lots at the ovens; By-Product, \$7.15 f.o.b., Chicago, prompt delivery.

**Old Material.**—In spite of the hoped for check to the downward movement which has for some time been sagging the Scrap market, dealers have as yet experienced no relief. While here and there some lines have strengthened slightly, there is still on the whole a weakening tendency. New railroad offerings aggregating 12,900 tons that will be thrown upon the market within the next few days will certainly not contribute to its strength. The following lists are offered: Chicago & Northwestern, 1200 tons; Wisconsin Central, 600 tons; Northern Pacific, 1800 tons; Atchison, Topeka & Santa Fé, 2800 tons; Baltimore & Ohio, 6500 tons. The following quotations are on gross ton lots, f.o.b. Chicago:

Old Iron Rails.....	\$27.00 to \$28.00
Old Steel Rails, 4 ft. and over.....	19.00 to 19.50
Old Steel Rails, less than 4 ft.....	18.00 to 18.50
Heavy Relaying Rails, subject to inspection, 50 lb. and under.....	31.00 to 32.00
Old Car Wheels.....	24.50 to 25.00
Heavy Melting Steel Scrap.....	16.00 to 16.50
Frogs, Switches and Guards.....	16.50 to 17.00
Mixed Steel.....	14.50 to 15.00

The following quotations are per net ton:

Iron Fish Plates.....	\$21.50 to \$22.00
Iron Car Axles.....	26.50 to 27.00
Steel Car Axles.....	22.00 to 22.50
No. 1 Railroad Wrought.....	16.00 to 16.50
No. 2 Railroad Wrought.....	15.00 to 15.50
Railway Springs.....	16.00 to 16.50
Locomotive Tires, smooth.....	16.00 to 16.50
No. 1 Dealers' Forge.....	12.50 to 13.00
Mixed Busheling.....	11.50 to 12.00
Iron Axle Turnings.....	11.50 to 12.00
Soft Steel Axle Turnings.....	11.50 to 12.00
Machine Shop Turnings.....	11.50 to 12.00
Cast Borings.....	9.00 to 9.50
Mixed Borings, &c.....	9.00 to 9.50
No. 1 Mill.....	10.50 to 11.00
No. 2 Mill.....	9.50 to 10.00
No. 1 Boilers, cut to Sheets and Rings.....	11.50 to 12.00
No. 1 Cast Scrap.....	18.00 to 18.50
Stove Plate and Light Cast Scrap.....	14.50 to 15.00
Railroad Malleable.....	16.00 to 16.50
Agricultural Malleable.....	15.00 to 16.00

## Iron and Industrial Stocks.

NEW YORK, February 6, 1907.

The stock market has recently exhibited decided uncertainty in its movements. A display of some strength has been followed by disheartening weakness, after which the market has again shown an upward tendency, only to be followed by a decline. Notwithstanding this condition of the market, the fluctuations have not been wide. The tendency on the opening days of the current week has been upward. Higher prices generally were realized on Tuesday than for a week previous. The range of prices on active stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 42¾ to 45, preferred 104 to 106¼; Car & Foundry common 41½ to 43½; Locomotive common 70 to 72; Steel Foundries preferred 41½ to 44¼; Colorado Fuel 46 to 49; Pressed Steel common 47 to 49½; Railway Spring common 50½ to 52½; Republic common 32½ to 35½, preferred 95½ to 97½; Sloss-Sheffield common 68 to 71¼; Cast Iron Pipe common 45¼ to 47. American Can has sharply recovered from its recent weakness, the preferred selling up to 53½ on Tuesday. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 44¾, preferred 104¾, ex-dividend; Car & Foundry common 42¾, preferred 101; Locomotive common 71¼; Steel Foundries common 9¾, preferred 42¾; Colorado Fuel 48¼; Pressed Steel common 49¼; Railway Spring common 52¾; Republic common 35¾, preferred 97¾; Sloss-Sheffield common 70¾; Tennessee Coal 159¾; Cast Iron Pipe common 47; Can common 5¼, preferred 54.

**Dividends.**—The Republic Iron & Steel Company has declared the regular quarterly dividend of 1¼ per cent., and an extra dividend of 2 per cent. on the preferred stock, both payable April 1. The declaration of the extra dividend cuts down the arrears of dividends on the 7 per cent. accumulated preferred stock to 2 per cent.

The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, has declared a dividend of 1¼ per cent., payable March 1, the former dividend being 1 per cent.

The Executive Committee of the Tennessee Coal, Iron & Railroad Company held a two days' meeting at Birmingham, Ala., last week, following an inspection of the various properties of the company and the new steel works and blast furnace construction at Ensley. The company's coal mines produced in January the largest month's tonnage since the strike in the summer of 1904, the total being close to 300,000 tons. Its coke ovens are producing in excess of the needs of its blast furnaces and it has been a seller of coke.

## Pig Iron Production in 1906.

The statistics of pig iron production in the United States in 1906, just collected by General Manager James M. Swank of the American Iron and Steel Association, show that the total was 25,307,191 gross tons, against 22,992,380 tons in 1905, an increase of 2,314,811 tons. The production in the first half is given as 12,582,250 tons and that in the second half as 12,724,941, or an increase of 142,691 tons. The output by States in 1906 is as follows, compared with the outputs of the three preceding years:

States.	Gross tons of 2,240 lb.			
	1906.	1905.	1904.	1903.
Massachusetts .....	20,239	15,987	3,149	3,265
Connecticut .....			8,922	14,501
New York.....	1,552,659	1,198,068	605,709	552,917
New Jersey.....	379,390	311,039	262,294	211,667
Pennsylvania .....	11,247,869	10,579,127	7,644,321	8,211,500
Maryland .....	386,700	332,096	293,441	324,570
Virginia .....	483,525	510,210	310,526	544,034
N. Carolina, Georgia and Texas.....	92,599	38,689	75,686	87,255
Alabama .....	1,674,848	1,604,062	1,453,513	1,561,398
West Virginia.....	304,534	298,179	270,945	199,013
Kentucky .....	98,127	63,735	37,106	102,441
Tennessee .....	426,874	372,692	302,096	418,368
Ohio .....	5,327,133	4,586,110	2,977,929	3,287,434
Illinois .....	2,156,866	2,034,483	1,655,991	1,692,375
Michigan .....	369,456	288,704	233,225	244,709
Wisconsin and Min- nesota .....	373,323	351,415	210,404	283,516
Missouri, Colorado and Washington ..	413,040	407,774	151,776	270,289

Totals.....25,307,191 22,992,380 16,497,033 18,009,252

The production of Bessemer and low phosphorus pig iron in 1906 was 13,840,518 tons, against 12,407,116 tons in 1905, an increase of 1,433,402 tons; or over 11.5 per cent. The production of basic iron in 1906, not including charcoal of basic quality, was 5,018,674 tons, against 4,105,179 tons in 1905, an increase of 913,495 tons, or over 22 per cent.

The production of charcoal pig iron in 1906 was 433,007 tons, against 352,928 tons in 1905, 337,529 tons in 1904 and 505,684 tons in 1903.

The production of spiegeleisen and ferromanganese in 1906 was 300,500 tons, against 289,983 tons in 1905, an increase of 10,517 tons. The production of ferromanganese alone in 1906 was 55,520 tons, against 62,186 tons in 1905. Of spiegeleisen alone it was 244,980 tons, against 227,797 tons in 1905.

The number of furnaces in blast on December 31, 1906, was 340, against 323 on June 30, 1906, and 313 on December 31, 1905. The number of furnaces in blast at the end of 1906 was larger than at the close of any year since 1889, when 344 furnaces were active. On December 31, 1906, there were 89 idle furnaces, as compared with 111 idle furnaces at the close of 1905.

The number of furnaces actually in blast in the second half of 1906 was 374, as compared with 361 in the first half. In 1905 the number in blast in the last half of the year was 349, against 334 in the first half.

**Quarrying Ice in Switzerland.**—The introduction of electric railroads into Alpine districts has been the means of establishing a new and somewhat strange industry—namely, the quarrying of glacier ice for distribution in large cities. It would appear that certain of the Swiss communes have been able to grant concessions of their glaciers for this purpose, and considerable sums have been expended in constructing ice slides or V-shaped troughs, in which the blocks of ice, often of large size, blasted out of the glacier, are transported to the vicinity of the stations for conveyance in carefully refrigerated cars to Lyons and other large cities remote from the Alps. The method of blasting with black powder so as to avoid the discoloration and soiling of the ice, and the engineering ability displayed in erecting the slides and in providing sufficient friction by means of curves to avoid excessive speed in the downward journey of the ice blocks, are spoken of as examples of considerable ingenuity and skill.

## The Exposition of Safety Devices.

The American Institute of Social Service, which has for its object the bettering of conditions in industrial life, has already done much by issuing literature calling attention to needless disregard of the life, safety or comfort of employees and others in various industries, and suggesting means for correcting conditions as they now exist. Much good has been done by reporting the progress made abroad as a result of similar movements, and now the institute has inaugurated an exposition of safety devices and industrial hygiene in the hope that interest may be aroused in establishing a permanent museum, such as the Museums of Security in Amsterdam, Munich, Paris and Berlin. This exposition was opened January 29, and will continue until February 12 and possibly later. It is being held in the Museum of Natural History in New York City, and is in charge of William H. Tolman, chairman of the committee and director of the American Institute of Social Service, having headquarters at 287 Fourth avenue, New York City.

Although this is the first such exposition in this country it has a very comprehensive and extensive collection. Among the exhibits are to be found fire escapes, fire doors and all kinds of protections against fire; lock nuts and various guards for machinery; automatic engine stops and safety valves of one kind and another; first aids to the injured and sanitary devices; elevator safety devices; trolley fenders; car couplers; railroad switches; safety gas burners and oil lamps; nonexplosive cans for storing inflammable liquids; apparatus for protecting those who work in dust or dangerous gases; ventilators, safety scaffolding; reports and photographs loaned by foreign museums of security; matters pertaining to workman's insurance; exhibits by associations for the prevention of accidents, and reports and treatises on safety devices, abuse of alcoholic drinks, industrial hygiene, &c. The exhibitors are too numerous to mention separately and the exhibits, although far from complete in showing even what this country alone can afford, are fairly representative. With each recurrence of this exposition, as its existence becomes more widely known, it will undoubtedly multiply in extent and scope. Even now, with the little advertising it has had, there is every indication of an intense interest in it. A very large number of visitors are attending daily, and this is not particularly because admission is free, for the idle and merely curious are in the minority. Certainly every one who can find it possible to visit this exposition while it is still in progress should do so.

For each ton of iron produced in a blast furnace it is said heat is wasted equivalent to 675 hp.-hrs. of developed energy, assuming a 26 per cent. efficiency for a gas engine using the heat. Since a modern blast furnace has a capacity for some 23 tons per hour, one such furnace should furnish the gas for more than 15,000 hp. continuously. Deducting the amount needed for blowing engines, pumps, &c., there would be available for outside work nearly 10,000 hp. Advantage of this fact is being taken in a number of recent installations, the Lackawanna Steel Company having installed three years ago 16 2000-hp. engines for operating blowing machinery, and eight 1000-hp. engines for direct connection to electric generators.

In the manufacture of large gate valves much trouble has been experienced because of the fact that the valve casting is liable to crack, especially at the corners and under heavy pressures. For a long time it was attempted to correct this trouble by strengthening the castings at the corners, but the results were not satisfactory. Analysis showed that the trouble was due not so much to lack of strength in the corners as to lack of stiffness in the sides. The latter being unsupported deflected outward under the water pressure, and thus the leverage effect obtained broke the castings at the corners. The side walls are now stiffened in the center to give them the same characteristics as a stiff girder, and are able to resist all ordinary pressures with but small deflection.



### The American Can Company's Report.

The annual report of the American Can Company shows the effects of the Pacific Coast disaster last April, but is not as unfavorable as had been expected. As the company has changed its fiscal year, the comparisons for the whole of 1906 have to be made with the period of nine months ended Dec. 31, 1905. Following are the figures:

	12 months, 1906.	9 months, 1905.
Earnings .....	\$2,534,367	\$2,524,135
Deduct for depreciation .....	184,327	212,718
Deduct for fire loss .....	236,619	.....
Total deductions .....	\$420,946	\$212,718
Net profit .....	\$2,113,421	\$2,311,417
Dividend .....	515,416	515,416
Surplus .....	\$1,598,005	\$1,796,001

The situation is thoroughly explained by President W. T. Graham, who, in his report to the stockholders, says:

"The San Francisco disaster put the two largest and one smaller Pacific Coast factories out of operation, and of the three, two were totally destroyed by the fire that followed, not only occasioning a large direct loss, which has been charged off, but a heavy loss through interruption to the natural course of business that cannot be estimated. Shipments were made against contracts for Pacific deliveries through the active season of the year from Eastern factories, to supply customers with goods, thus saving their business from interruption and loss, but entailing large extra expense and a material loss on this part of the business of the company that would otherwise have netted a profit. No other company had or has the facilities to meet such conditions, and California packers published their recognition of the company's service in the strongest terms, and the prestige gained may compensate you in the future for the immediate loss.

"Good progress in systematizing and organizing the several departments of the business has been made since the last annual meeting. Cost accounting has been improved and has become an efficient and correct guide to transactions, and all departments are more intelligently conducted than was possible before this accurate data was available.

"Expenditures for new factories and improving old ones are shown to have been justified by results, so far as they have been completed and put into operation, both in respect to meeting the requirements of an increasing trade and reducing the cost of manufacture. The factories replacing the two at San Francisco, and one at St. Paul, which were destroyed by fire, and new ones at New Orleans and Savannah are nearing completion and will all be in operation this spring. Another factory has been authorized at New Castle, Pa., and is partly under contract.

"In addition to \$184,326, written off for depreciation, there has been expended during the year, and charged to operating cost as expended, \$420,582 in maintaining and \$99,756 in bettering the physical condition of the factories. The volume of business for 1906 was greater and expenses were less than in any previous year, and these conditions promise to hold good through 1907."

The condensed balance sheet, as of Dec. 31, compares as follows:

	Assets.	1906.	1905.
Plants, real estate, &c. ....		\$74,568,559	\$74,854,299
New construction, &c. ....		4,345,132	3,376,043
Other investment items .....		1,493,070	649,299
Cash .....		1,001,618	3,311,519
Accounts and bills receivable .....		1,924,100	1,273,957
Merchandise inventory .....		5,315,811	4,285,390
Totals .....		\$88,648,290	\$87,750,507
	Liabilities.		
Preferred stock .....		\$41,233,300	\$41,233,300
Common stock .....		41,233,300	41,233,300
Accounts and bills payable .....		1,567,506	721,479
Dividend payable January 1 .....		515,416	515,416
Surplus .....		4,098,768	4,047,012
Totals .....		\$88,648,290	\$87,750,507

The retiring Board of Directors was re-elected.

### Labor Notes.

The employees in the rolling mills of the Burden Iron Company, Troy, N. Y., were given an increase in wages on February 4, the company taking the initiative. The advance to puddlers is 25 cents a ton, and to roughers, rollers and heaters in proportion.

Furnace workmen in the Pittsburgh District and in the Mahoning and Shenango valleys are again agitating the matter of an eight-hour day, the men to work three turns of eight hours each, instead of two turns of 12 hours, as at present. James McMahon of Struthers, Ohio, is president of the National Association of Blast Furnace Workers and Smelters and is active in the present movement. Arrangements are under way for a mass meeting of blast furnace workers, to be held in Pittsburgh at an early date.

**New Blast Furnace Construction.**—The American Iron and Steel Association has reports showing that on December 31, 1906, 27 blast furnaces were in course of erection in the United States and 5 furnaces were being rebuilt. Of the building furnaces 2 were in New York, 11 were in Pennsylvania, 2 were in Alabama, 3 were in Ohio, 5 were in Indiana, 2 were in Illinois, 1 was in Wisconsin and 1 was in Colorado. All these furnaces when completed will use coke or mixed anthracite coal and coke for fuel. Of the 5 rebuilding furnaces 1 was in Pennsylvania, 2 were in Alabama, 1 was in Illinois and 1 was in Washington. When rebuilt 4 furnaces will use coke for fuel and 1 furnace will use charcoal. In addition there were 23 furnaces projected and 1 furnace partly erected on December 31. If built all projected furnaces will use mineral fuel.

The Standard Steel Car Company, Pittsburgh, will build a large car wheel plant at Butler, Pa., where its steel car works are located.

Robert W. Hunt & Co. have been appointed consulting engineers to the receivers of the Union Traction Company, Chicago, and placed in direct charge of the lowering of the car tunnels under the Chicago River.

The continuous rod mill of the Dominion Iron & Steel Company, Limited, Sydney, N. S., was put on double turn November 5, 1906. During that month the mill rolled 6485 gross tons, during the month of December 6757 gross tons, and during the month of January 7966 gross tons, this last month's production being 566 tons ahead of its previous record month's tonnage of 7400 tons, made in January, 1906.

An official statement has been issued showing in detail the exact cost of construction of the sister battleships Connecticut and Louisiana, the former built by the Government at the New York Navy Yard and the latter by the Newport News Shipbuilding Company. It appears that the Government built ship cost complete \$359,425 more than the private built ship. The exact figures were (including armor and turret mounts and machinery) for the Connecticut \$6,340,247 and for the Louisiana \$5,980,822. The Louisiana's armor weighed 35.23 tons more.

The McClintic-Marshall Construction Company, Pittsburgh, works at Rankin, Pottstown and Carnegie, Pa., has received a contract from the Standard Steel Car Company for the erection of a steel building, 110 x 483 ft. and 54 ft. high to the lower chord, to contain a forged steel car wheel plant; also a contract for an extension to the present cast steel car wheel plant of the Standard Steel Car Company at Butler, Pa., which will require about 400 tons of steel. The Construction Company is making plans for additions to its works at Carnegie, Pa., which will give that plant an output of about 2000 tons of fabricated steel per month.

## The Machinery Trade.

NEW YORK, February 6, 1907.

The past week has been devoid of large inquiries for machine tools, but those of smaller size were plentiful and orders came in freely. Machinery houses are taking all the business that they can conveniently handle, but it is from scattered sources, no single order being reported large enough to cause comment. Announcements of increase in prices continue to be received, but they cause little disturbance in business, as buyers are so anxious to secure tools that they are willing to pay the advance. The high prices are, however, causing dealers to become more cautious in ordering tools for stock at future delivery, and it is thought that they will carry as little stock as is possible, fearing to be caught with tools at high prices in a falling market. As it is now, dealers have to place orders some months ahead in order to have tools to deliver to customers, and as it is not easy to gauge one's business months in advance, this question has become an important one with the dealer. Important projects have lately come to light that will undoubtedly call for large quantities of tools. One of these is the Panama Construction Company, which has been incorporated, with a capital stock of \$5,000,000, by prominent capitalists, who seem to be in a fair way to secure the contract for constructing the Panama Canal. This, with the new subway, contracts for which will soon be let, will probably increase the demand for contractors' machinery considerably.

The tendency on the part of manufacturers to refuse to put in contracts a penalty clause covering the question of delivery is becoming more and more prevalent. While the majority of sellers do their best to keep their promises in that respect, many of them refuse to take chances of losing money through their inability to deliver on time. The plea is made that shipments of material cannot be entirely relied upon and with shops running at full capacity there are always possibilities of unavoidable delay in delivering an order. The anxiety of buyers just now to get equipment as early as possible generally saves the possibility of argument on the subject, and some cases have been noted in the trade where a bonus clause for quick delivery has been inserted in contracts which contained no stipulation as to penalties for late deliveries.

The Niagara Frontier Purchasing Agents' Association met on Saturday evening, February 2, at the Lenox Hotel, Buffalo, N. Y., and after partaking of what they were pleased to term a Dutch supper the members listened to an address on "The Cost of Electrical Power as Compared With Steam," by E. Richards, electrical engineer of the Hydro-Electric Government Commission of Canada.

Owing to the advance in the price of raw material and cost of labor the A. & F. Brown Company, New York, has withdrawn all quotations on shafting, pulleys, gears, friction clutches, &c., the change taking effect February 1.

### Baltimore & Ohio's Machinery Requirements.

From all accounts the list of machinery and tool requirements sent out by the Baltimore & Ohio Railroad, which was given in these columns last week, is by no means all that that company intends to purchase in the near future. Parties in the trade who are close to the movements of the company have it that a good sized list which will include some machine tool equipment is in the course of preparation and will be issued shortly. It will be remembered that the list which was before the trade last week consisted largely of boiler shop and forging equipment, and it is probable that the machine tool requirements will be taken up separately.

The St. Louis & San Francisco Railroad has secured an option on 300 acres of land near Springfield, Mo., where it intends to build new locomotive and car shops and a creosoting plant. The proposition laid before the Springfield Club by the railroad company asks the citizens to put up a bonus of \$45,000 to pay for the land, and in addition the company agrees to spend \$1,000,000 on the plant.

The Standard Cast Iron Pipe & Foundry Company has inquiries in the market for some equipment for its proposed new plant to be erected at Bristol, Pa. It is understood that the material will be purchased through the American Pipe Mfg. Company, Philadelphia.

Westinghouse, Church, Kerr & Co., 8 Bridge street, New York, have been buying considerable equipment for a large new plant in course of construction for the Sawyer-

Man Company at Watsessing, N. J. The Sawyer-Man Company, which now has a plant on West Twenty-third street, New York, will probably abandon its New York plant when the New Jersey factory is completed. Its new quarters will consist of a main building for general manufacturing purposes, 100 x 575 ft., three stories in height; a four-story storehouse about 80 ft. wide and 140 ft. long, and a power plant, 80 x 80 ft. The Westinghouse interests, with which the Sawyer-Man Company is allied, will furnish the power equipment, but it is understood that there is a good deal of buying in the way of light machinery equipment, such as is used in the making of electric lamps, which is the chief output of the Sawyer-Man Company. The new plant is well under way, and it is expected that it will be completed by spring, when the machinery equipment of the New York plant will, it is understood, be moved there. This will be by no means sufficient to supply the needs of the company in that line, however, as the new plant will be about double the size of the present facilities.

Machinery is being purchased by the Maxwell-Briscoe Motor Company, Tarrytown, N. Y., for equipping its new plant at New Castle, Ind., where it proposes to remove its present plant. The company has not issued a list of its machinery requirements, but is buying a few tools at a time and will continue to do so until a complete equipment is secured. The plant which the company is to build for the manufacture of automobiles will have a main building, 60 x 720 ft., two stories; forge shop, 60 x 250 ft., two stories, and a machine shop, 250 x 660 ft. The power house will be 50 x 200 ft. It is expected that the building will be ready for occupancy by May.

The Maryland Portland Cement Company, Baltimore, Md., is having preliminary plans for a new plant made by F. H. Lewis, Leeds, Ala., who will buy and install the plant equipment. De Courcy W. Thom, 825 Equitable Building, is interested in the company.

### The Longacre Electric Plant.

The Longacre Electric Light & Power Company, which is controlled by interests affiliated with John C. Sheehan, 252 Broadway, New York, is placing contracts for a large power house to be erected in the vicinity of Longacre square, New York. The company proposes to put up at first a plant of about 10,000 hp. capacity, and contracts for the engines have already been placed with the Wilkinson Steam Turbine Company. This, it is understood, is only the initial size of the plant, which is expected to be made much larger in the very near future. The company proposes to furnish power in competition with those already in that field, and it is understood that a number of provisional contracts have been made that will dispose of a large part of the power now provided for.

Winnipeg, Man., is to construct a hydro-electric power plant on the Winnipeg River at Point du Bois Falls, near the city, for the development of 60,000 hp. The first development will be for about 20,000 hp., and bids for the mechanical equipment for this first installation will be called for in the course of the next six weeks. Bids are now being asked for 24 miles of standard gauge tramway to be built from the Canadian Pacific Railroad to the side of the works, for the purpose of transferring the materials. Cecil B. Smith is engineer of the power construction department.

Inquiries are in the market for two 100-kw. generators for direct connection to two 155-hp. engines to be installed in a new printing plant now in course of construction at 257-263 West Seventeenth street, New York, for A. Filmore Hyde, 60 Wall street, New York. W. S. Timmins, 150 Nassau street is the engineer. The plant will be leased to other parties.

The Atha Tool Company, Newark, N. J., is making some additions to its plant on Chapel street, that city, the details of which are being looked after by Fred Phelps, engineer 15 Clinton street, Newark. Among other things the company is in the market for an engine of from 75 to 100 hp.

### Business Changes.

Carrying out its policy of establishing stores in the different cities in the United States in which it has heretofore maintained offices, the Chicago Pneumatic Tool Company, New York, has opened a store at 820 Arch street, Philadelphia, Pa., where it will show its tools in operation.

Among other recent steps taken to meet the rapid extension of their business, W. S. Barstow & Co., New York, and Portland, Ore., have added to their organization a commercial department, which has been placed in charge of G. H. Noble. Mr. Noble is well known in electrical circles, having been for six years a salesman in the New York office of the Stanley G. I. Electric Mfg. Company.

**Catalogues Wanted.**—The Litchfield Engine Company, Litchfield, Ill., desires catalogues of supplies, tools and material pertaining to engine building and general foundry and machine work.

The Carbine Hardware Company, Madison, Ga., is in the market for concrete machines for block and brick work, and desires catalogues and prices on this class of equipment.



## Philadelphia Machinery Market.

PHILADELPHIA, Pa., February 5, 1907.

The volume of business transacted in the local machinery market during the month of January was, in almost every instance, fully up to the average for that month. In some cases a larger amount of business was transacted, while in others the total was slightly under that for the same month last year. Both manufacturers and dealers, however, are well satisfied with conditions, and from the nature of recent inquiries look forward to a greater volume of business in the near future.

Advances in prices on various machine tools continue to drift in. Manufacturers who had not made advances early in the month have followed the lead of others who had, and the whole line is now pretty well covered. Dealers advise of having received notices of advances on upright drills and on several lines of lathes built by out of the city manufacturers, which became effective late in January and on February 1.

There has been quite a good volume of inquiries before the trade during the past few weeks, the greater number, however, being for single tools and small equipment. Manufacturers and dealers are busy estimating on the list of the Baltimore & Ohio Railroad, which recently came out, while quite a number have received partial specifications for the requirements of the new plant of the Standard Cast Iron Pipe & Foundry Company, which is to be built at Bristol, Pa. Several other fair sized propositions are talked about, but have not yet reached the stage where even the prospective buyers themselves know just what they want.

Manufacturers continue as fully occupied as ever. Such business as comes in from time to time is keeping them fully occupied, and under the circumstances there is little chance of catching up on deliveries. In fact, shipping dates are, if anything, a little more distant, and the tendency on the part of tool builders to refrain from naming definite delivery dates seems to be increasing.

A little quiet inquiry has developed for tools for export. The business is not large, it is said, but covers a fair line of general tools. Deliveries, however, are the most important factor against the closing of foreign business at this time, as manufacturers are so fully occupied with the home trade that it is practically impossible to work in anything whatever for early delivery, be it for domestic or export account. Heavy special tools have been in somewhat better demand for export, but as these, as a rule, are not subject to early delivery, that feature does not affect the business as much as it does in the so-called standard lines of tools.

A fair business continues to be done in heavy engines and large power equipment. In the medium and smaller powers, however, the demand is not as active, particularly for such as would be subject to early closing. Second-hand boilers and engines have also been in light demand, but, on the whole, this condition is not entirely unusual at this season of the year.

Second-hand machine tools are still very active. Buyers in many cases are endeavoring to get tools for their urgent needs in the second-hand field, and are frequently quite successful. In some cases, however, the market is pretty bare of desired tools, although dealers are making every effort to keep their stocks in good shape. Prices have advanced in a number of cases, owing largely to the competition, not only on the part of the dealers, but by the direct purchaser, who has now entered that field in search of required equipment.

The foundries are still having trouble to get prompt supplies of raw materials, and from present weather conditions it looks very much as if that delay would increase rather than be relieved in the immediate future, particularly as far as transportation is concerned. Both gray iron and steel casting plants are producing large tonnages, and are as a rule considerably behind in deliveries. More business appears to be offered than can be taken care of, and frequently builders of machine tools as well as other users of castings are compelled to go out of the city to get castings, and even then are unable in most cases to get good deliveries.

The Philadelphia Supply & Machinery Dealers' Association, which was organized in this city a year ago, and of which W. A. Shipley is secretary, will hold its first annual meeting February 20. The meeting will be followed by a banquet at the Bellevue-Stratford Hotel.

The Standard Cast Iron Pipe & Foundry Company, which will erect a plant at Bristol, Pa., has about completed the plans for the erection of the buildings, and will shortly begin the work of erection. Specifications are out for a portion of the machine tool equipment, and it is understood for cranes and other appliances. The present machine tool specifications will, it is said, aggregate an expenditure of \$40,000.

C. H. A. Dissinger & Brother, Wrightsville, Pa., manufacturers of gas and gasoline engines, have under consid-

eration the moving of their plant to Columbia, Pa., in which event they would erect a building 60 x 200 ft. for machine shop and general manufacturing purposes. If the transfer is made they will be in the market for a number of machine tools, as well as other equipment.

The R. S. Newbold & Son Company, Norristown, Pa., is preparing plans for a new boiler shop, 80 x 200 ft., which it expects to erect during the coming summer. It is just finishing a new and larger power house, and when this is completed proposes to install an additional traveling crane in its foundry. This concern has been very busy throughout the year past, and has sufficient business on hand to keep it fully occupied for several months ahead. Orders recently taken by the company include one for a large angle straightening machine and a heavy scrap shear to cut 6-in. square billets for the Carnegie Steel Company; also an order for a heavy plate bending machine with 16-ft. rolls for the American Bridge Company. Heavy castings, weighing upward of 50,000 lb., have been furnished the Lukens Iron & Steel Company, while a heavy improved plate straightening machine has been shipped the Central Iron & Steel Company, Harrisburg, Pa., and several carloads of furnace machinery have been shipped the Hamilton Iron & Steel Company, Ontario, Canada.

The Tindel-Morris Company, Eddystone, Pa., continues very active in all departments. Additions to its equipment of special machinery for crank shaft work have enabled it to greatly increase production, so that during 1906 this branch of the business netted an increase of 50 per cent. over any previous year. Part of the plant is now being operated double turn, and deliveries of finished crank shafts can be made with reasonable promptness, particularly those of chrome-nickel steel, with which it has been very successful. Inquiries and orders for Tindel-Albrecht crank shaft lathes are reported to be increasing largely, and deliveries on 12 and 17 in. sizes can be made promptly.

The Baldwin Locomotive Works suffered considerable loss by fire on January 29, when one of its buildings at Fifteenth and Spring Garden streets, comprising a paint shop, sheet metal working shop, drawing rooms, connecting rod finishing shop and storerooms, was partially destroyed. The greatest loss was in the drawing room, which contained drawings of electric trucks and locomotives, to which branch of the business it was attached. The aggregate loss has been fixed at \$500,000. The building will be rebuilt at once, the contract already having been let to Roydhouse, Arey & Co. Practically nothing in the way of machine tools was destroyed, being only slightly damaged by water, and no new purchases on this account will be made. The Baldwin Works continues very busy in all departments, and its steam locomotive business will in no way be interfered with on account of the fire. Orders are being received in good number, mostly, however, in small lots, from both railroads and industrial concerns. This concern has during January been shipping on the average eight locomotives a day, and has a large amount of business on its books.

The Hilles & Jones Company, Wilmington, Del., has completed the purchase of all the equipment for its new machine shop extension, to which attention has previously been called in these columns. It has also placed an order for an additional crane for the foundry department. Orders for tools, the company states, have been coming in at a very satisfactory rate during January and all departments are being operated at their utmost capacity. Orders recently taken include a number for punches, shears and other boiler shop equipment from various railroads and private concerns, as well as one for 18 rail straightening presses for the Indiana Steel Company, Gary, Ind.

The High Duty Saw & Tool Company, Eddystone, Pa., is very busy and has orders, particularly for Paragon high duty sawing machines, sufficient to keep it busy for some time. Tindel high duty saw blades, for use on any make of machine, can be had more promptly, however, and a large number have been furnished railroad shops and steel mills both in this country and abroad.

The Link Belt Company, Philadelphia, Pa., which maintains branch offices in many of the large cities, has opened a branch office at 321 Ellicott square, Buffalo, N. Y., under the management of H. C. Minier. Another branch office has been opened at 440 New York Block, Seattle, Wash., where E. G. Brabrook is in charge. The opening of these branch offices will place the company in a better position to give personal attention to the trade in the adjacent territory, the office in Buffalo covering that city and neighboring territory in New York, Pennsylvania and Ohio, and the one at Seattle covering the Far East, Washington, Oregon and surrounding territory.

The turbine steamship Harvard, a sloop ship to the Yale, was successfully launched January 31 by the Delaware River Iron Shipbuilding Company, Chester, Pa. This vessel, as was the case with the Yale, will be towed to Hoboken, N. J., for its engine equipment. Both vessels will be used by the Metropolitan Line in the outside service between New York and Boston.

## Cleveland Machinery Market.

CLEVELAND, OHIO, February 5, 1907.

The demand for machine tools has been very heavy the past week, and a large number of small orders have been booked by local dealers. The demand is principally for two or three tools for additional plant equipment, but one dealer reports having received good sized orders for the equipment of new plants in Ohio and Michigan. Altogether the sales the past month have been very large, and the inquiries now coming in indicate a large amount of business for the next few weeks at least. Deliveries show no improvement and are worse on milling machines than on any other kind of machine tools. Deliveries are promised on the smaller sizes of millers in May or June, but deliveries of the universal milling machines cannot be had within 8 or 10 months.

While one dealer has not advanced the price of machine tools since the advance in lathes noted two weeks ago, another local dealer quotes an increase of from 5 to 10 per cent. on planers, boring mills and other tools. About the only tool that has escaped the advance is milling machines. The leading makers of these machines, it is announced, are trying to avoid raising prices, but fear that they will be forced to make an advance if the present high prices of material keeps up.

There is still a good demand for second-hand tools, but the supply of good heavy tools that are now demanded by the trade, especially by automobile manufacturers, is scarce. There is a fair supply of cheap, light, second-hand tools.

The demand for all kinds of hoisting and conveying machinery for mines is still heavy, and local manufacturers report an unusually large demand for heavy forging machines. Local machine manufacturers doing a foreign business report that their export demand continues good.

The Standard Welding Company having outgrown its present quarters at Central avenue and East Seventieth street, has bought a new site covering five acres between Seventy-fourth and Seventy-sixth streets, N. W. The site has 450 ft. frontage on the Lake Shore Railroad. The company is now having plans prepared, and as soon as spring opens will begin the erection of a large up to date factory which, it is claimed, will be a model of its kind. There will be three or four buildings that will provide three acres of floor space. The buildings will be of steel, brick and mill construction with cement ground floors. One building will be used for annealing and plating, another for the heating and power plant and a third for a warehouse. The main building will be 50 x 450 ft., three stories high, and connected with this will be a one-story building 75 x 450 ft. covered with a saw-tooth roof, giving the factory a first floor space of 125 x 450 ft. The company will equip the factory with a large quantity of new machinery, of which it will buy a few bolters, presses and some machine shop tools. In addition about \$50,000 will be spent on machine tools that it will make itself or have made to order. Plans have not yet been decided upon for the power equipment. It is expected that the new plant will be ready for operation in October.

The Ferry Cap & Set Screw Company, which was recently incorporated with a capital stock of \$50,000, has commenced the erection of a brick factory building, 40 x 150 ft. on Scranton road. The company will make high grade steel cap and set screws. Its office is at present located at 1015 Schofield Building. I. P. Lamson is president; Thomas Ferry, vice-president; W. C. North, secretary and treasurer, and George North, sales manager. Mr. Ferry was for several years superintendent of the National Screw & Tack Company of this city.

The National-Acme Mfg. Company has awarded contracts for the erection of an addition to its present plant. The new building will be of brick and steel construction, about 35 x 400 ft. and six stories high. The company's business has grown to such an extent that it is cramped for room, and the plant is now being run 22 hr. a day. The company will require very little new machinery, as many of the tools will be moved from the old plant, and others will be built in its own factory.

The Borden Company has broken ground for the erection of a new plant in Warren, Ohio, which, it is claimed, will be the largest factory in the world devoted exclusively to the manufacture of hand and power pipe threading machines. The building will be of brick and structural iron, making it fireproof. It will be one story high, with a handsome two-story office. The plant will be equipped with the most modern machinery. The company expects to move into its new quarters in the spring.

The American Steel & Wire Company is preparing plans for the erection in the spring of a machine shop adjoining the Newburg wire mill. The building will cost about \$6000. Some new machinery will be installed.

Owing to its large increase of business, the shops of the Standard Chain Company at St. Marys, Ohio, will be en-

larged at once. An extension of 100 ft. will be built to the main building.

The Champion Rivet Company is just completing what is declared to be the largest exclusively rivet manufacturing plant in the world. The plant is located in the Erie Railroad at the junction of Rice avenue. The buildings are located on a 23-acre plot of ground and cover an area of about 4½ acres. They are all of steel, brick and slow burning construction. The power plant is designed to furnish about 700 hp. All machinery is electrically driven and all material will be handled by traveling cranes and conveyors. Producing capacity will range from 200 to 250 tons per day, and storage capacity will accommodate over 10,000 tons of bar and coiled steel and 15,000 tons of finished rivets. The company manufactures high grade rivets ½ in. in diameter and larger.

## Chicago Machinery Market.

CHICAGO, ILL., February 5, 1907.

The rapid increase in production of steel cars is one of the important factors contributing to the strong demand now experienced by manufacturers of the heavier types of shears, punches and shape forming tools. This is true not only because of expanding shop capacities, but also by reason of replacements made necessary by the heavier material used in the later car models. Not only are stronger machines with increased range of capacity required, but improved design in steel car construction has resulted in forms of work which to handle with speed and economy demands tools of special construction, all of which contribute to the generous volume of business now enjoyed by manufacturers of this class of machinery. Electrical equipment, in sympathy with the upward movement of copper and other crude material, has been gradually tending toward higher price levels, and within the past few months a noticeable stiffening of prices has resulted, but actual advances are, it is claimed, not yet commensurate with the increased costs of material. Order books are well filled for weeks ahead, and inquiries for new installations and extension of electrical equipment still coming in seem to assure an increasing rather than a diminishing demand for months to come. There is no cessation in the unprecedented press of business in machinery tool lines that for some time past has been taxing capacities of manufacturers to their fullest limit. Stocks of standard tools have been further depleted by shipments during the past week, and the floors of several large houses on Machinery Row are scantily stocked with new tools in many important lines. Spot shipment of high grade special tools and automatic machines, when it can be given, commands a premium. The market is being scoured for second-hand tools, and goods of inferior class that formerly would not have commanded the consideration of buyers are now finding ready sale. Because of orders taken at former prices for future shipment manufacturers of machinery tools will generally not realize any benefits from recent advances until future months, when deliveries on old contracts have been completed.

The Chicago, Milwaukee & St. Paul Railroad, Chicago, is in the market for the following list of tools: One single punch and shear with 42-in. throat, arranged for motor drive; one power plate bending rolls, at least 8 ft. between housings, belt drive; one flue welding furnace; one extra heavy double axle lathe, with taper attachments; one 16-in. back geared bolt lathe, one 42-in. double head vertical boring and turning mill, one 4-spindle gang drill, one heavy car wheel boring machine, and one 42-in. by 42-in. by 8-ft. planer.

The Chicago Great Western Railroad is contemplating extension of its shop buildings at Oelwein, Iowa, but the extent of the improvement, with its necessary tool equipment, has not yet been fully determined.

The Oswald Motor Company, Goshen, Ind., which has recently equipped a factory for the manufacture of motors, will in the near future be in the market for one or more 24-in. lathes.

The Oklahoma Portland Cement Company, Ada, I. T., has just commenced the construction of a dry process cement plant, which will have a capacity of 1000 barrels per day. Contracts for the machinery equipment are, with few exceptions, already placed, one 600-hp. alternating current generator and one 300-hp. alternating current motor being furnished by the Fort Wayne Electric Works, Fort Wayne, Ind. The conveyors for the plant have not yet been purchased, but it is expected that orders for this part of the equipment will be placed within the next two weeks.

The American Refractories Company, Joliet, Ill., which last year completed a new plant for the manufacture of



high grade silica brick, has joined interests with the Olive Hill Fire Brick Company, Olive Hill, Ky., and will establish a joint selling agency, which after May 1 will be established in the new Commercial Bank Building, Chicago. In the meantime all business will be transacted at the office of the Joliet plant. E. L. Allen, vice-president and general manager of the American Refractories Company, will have charge of the new agency.

The Falk Mfg. Company, Milwaukee, founder and manufacturer of rail welding devices, has filed an amendment to its articles of incorporation increasing its capital stock from \$500,000 to \$750,000, the increase of capital to be used for the purchase of new machinery for the plant.

Among the orders recently placed by the Geo. Whiting Company, Chicago, manufacturer of punches, shears and bending rolls, are the following: Two horizontal punches and one 24-in. throat double end punch for the Pacific Coast; one 48-in. punch, Indiana Bridge Company, Muncie, Ind.; one straightening steel roll, specially designed, Illinois Steel Company, Chicago; one double beam punch, Allis-Chalmers Company, Milwaukee, Wis.; two quick acting punches, R. Monroe & Sons, Pittsburgh.

## New England Machinery Market.

WORCESTER, MASS., February 5, 1907.

The past week appears to have proved that the advance in machine tools has had little or no effect upon the demand. Dealers report the usual volume of inquiries and of orders limited only by deliveries. Conditions generally are healthful. The woodworking machinery people are exceedingly busy, the calls for this class of tool being commensurate with that for machine tools. Pumping machinery, engines, boilers and other power house appliances, including turbine water wheels and other accessories of hydro-generating equipment, are in active demand. All types of combustion engines for all sorts of purposes are finding a quick and profitable market.

No large lists of machine tools are out. In fact, it does not often occur that New England has a purchaser on a very large scale, the exceptions being the railroads and electric manufacturing companies, and none of these is at present in the market, excepting for limited amounts of machinery. The navy yards are buying occasional tools on requisition.

The dealers are receiving frequent notices from machine tool builders, cutting out certain sizes of machines which they do not find as profitable as others in the present market. This tendency has been noted before in *The Iron Age*. In some instances lists have been simplified permanently. One planer builder, for instance, who has been building a 33-in. planer, has dropped it for good. Other similar cases could be related. But most of the announcements of withdrawals of machines from the market are temporary, or, at any rate, no decision to cease their manufacture permanently has been reached. Planer builders are avoiding orders for widened machines, which they now consider as special tools. There is also an inclination in New England among those manufacturers who have been building a wide range of machines, that is to say, both small and large sizes, to cease the manufacture of the heaviest sizes. This is not a new tendency, but it is being accentuated at this time. The concentration of manufacturing energy on a few sizes is resulting in larger production, which means quicker deliveries and more profits.

The deaths of Henry J. Hendey, Edward Payson Bullard and Joseph Flather, founders of great New England machine tool industries, remove strong figures, whose names will survive in those of the Bullard Machine Tool Company, Hendey Machine Company and Flather & Co., Incorporated. The passing of such a group of men, practically simultaneously, leaves a large gap in the ranks of machine tool builders, and in the National Machine Tool Builders' Association. Considered as individuals, each had done a great work in up-building an important industry. Their work considered as an unit was an enormous influence in the development of the machine tool, mechanically and commercially. Their ages were not so great as to have precluded years of usefulness had they lived. Mr. Flather was the eldest; he would have been 70 in April. Mr. Bullard was 65 and Mr. Hendey 62 years. It is well that each leaves the business he has built up in capable hands, so that it may be perpetuated in the same ratio of development that has characterized it in the past.

That the machine tool auction has become an institution of much importance during these times of unprecedented demand for metal working machinery was evidenced at the two sales which took place simultaneously in the adjoining cities of Providence and Pawtucket, R. I., Thursday, January 31. That of the equipment of the James Brown Machine Company, Pawtucket, was the more important in every way, for the shop is a large one and contained a great

number of machines of all types, and, it may be added, of all ages. That of the Rhode Island Motor Company, Providence, was not a large affair in the number and importance of tools put under the hammer, but its results also served to demonstrate that the records made by previous auction sales of machine tools in New England, including those of the Shaw Machine Company, Lowell, Mass., and the W. S. Burn Company, New Haven, had little effect upon the urgent need of machinery, which resulted in extraordinary prices for old tools as well as new.

The tools in the Brown shops were mostly old, many of them very old indeed, dating back half a century. One planer actually had a wooden bed, with iron ways bolted to it. Yet most of these machines brought prices which indicated that they are not to be converted into scrap, though at any other time than this it would have been considered preposterous to have regarded them as possessing any other element of usefulness. An ancient planer, with a 46-ft. bed, mounted on slender legs, and with housings and cross rail so light as to be seemingly useless for modern practice, brought a figure greater than its market price as scrap. Some of the machinery, however, was comparatively new, having been installed three years ago by an automobile company which started to manufacture in these shops, but which has since gone elsewhere, leaving the tools behind. A large percentage of these latest machines were not new when purchased, so that models of the past few years were rare. Yet in a number of instances prices above the present lists of their builders for new machines were paid, and gladly. The most notable instance of this was with the three Potter & Johnston automatics, which brought \$1450, \$1475 and \$1500 respectively, the smaller size, being the last sold, bringing the largest price. It will be noted that these are well above the present price for new Potter & Johnston machines. Another striking instance was a lot of six engine lathes built by the F. E. Reed Company, Worcester. These machines were formerly in the Reed shops at Worcester, and were sold three years ago because the company wished to replace them with latest models. Yet they brought \$270 each, which is practically \$100 more than they were sold for. As an illustration of how the very old tools went, two Brown 30 x 14 in. planers, with 6-ft. bed, brought \$140 and \$100 respectively, though they are mere skeletons in construction as compared to modern machines. Had this auction taken place two years ago probably nine-tenths of the tools would have been sold to be broken up as scrap, on the basis of the price of iron at that time.

A large crowd of users of machine tools and machinery dealers was present, and the bidding was spirited throughout. The dealers bought but little, because of the high prices, though they bid on the more modern machines. A striking feature of the auction was the high prices for small tools and old belting. Below are some of the prices paid for some of the more important machines:

Two Potter & Johnston chucking and turning machines, 7 x 14 in.	\$1,450.00 and \$1,475.00
Potter & Johnston chucking and turning machine, 5½ x 11 in.	1,500.00
Pratt & Whitney 1½-in. turret lathe	685.00
Pratt & Whitney 1-in. turret lathe	412.50
Four Blaisdell screw cutting lathes, 16 in. by 6 ft., each	205.00
Blaisdell screw cutting lathe, 18 in. by 6 ft.	245.00
Flather screw cutting engine lathe, 14 in. by 6 ft., old type	160.00
Flather screw cutting lathe, 16 in. by 6 ft.	187.50
Windsor No. 4 turret lathe, Acme thread cutting machine and 10-in. grinder on post, sold in one lot	400.00
Brainard No. 3 universal milling machine	305.00
Two Brown 30 x 14 in. by 6 ft. iron planers, very old style	\$140.00 and 100.00
Smith & Mills 16-in. shaper	240.00
Whitton automatic gear cutter	575.00
Milwaukee No. 1 universal milling machine	560.00
Hendey screw cutting engine lathe, 16 in. by 6 ft.	210.00
Sellers 20 x 14 in. by 6 ft. iron planer	250.00
Brown 51 x 34 in. by 46 ft. iron planer, very old	210.00
Six Reed screw cutting engine lathes, 16 in. by 6 ft., each	270.00
Reed screw cutting engine lathe, 16 in. by 6 ft.	320.00
Greenfield tool grinder	215.00
Niles-Bement-Pond four-spindle drilling and tapping machine	175.00
Becker-Brainard No. 50 vertical miller, without rotary attachment	825.00
Putnam engine lathe, 36 in. by 16 ft.	175.00
Putnam 34-in. upright drill	108.50

The shop buildings were bid in by the Brown family. The tools of the Rhode Island Motor Company, Providence, which sold at the disadvantage of having the larger auction in progress at the same time at Pawtucket, brought equally good prices. Among the sales were the following:

Prentice Bros. 24 in. by 12 ft. engine lathe	\$500.00
Prentice Bros. 16 in. by 8 ft. engine lathe	295.00
Gould & Eberhardt 24-in. crank shaper	410.00
Hamilton 28-in. upright drill	200.00
Hamilton 24-in. upright drill	145.00
Dexter 12-in. engine lathe	93.00
Blount 12 in. by 5 ft. speed lathe	39.00
Blaisdell 15 in. by 8 ft. engine lathe, old style	125.90

None of these machines are of latest type, which makes the prices paid all the more notable.

The Connecticut Computing Machine Company, New Haven, Conn., manufacturer of computing machines, has

leased the buildings on York street formerly known as the New Haven Wheel Shops. The main building is of brick, mill construction, 45 x 120 ft., five stories, and the rear building 40 x 80 ft., three stories. The works are equipped with a power and electric lighting plant. The company will immediately install a sprinkler system and water tower. It had intended to build a new plant, being forced to find other quarters by the occupancy by new owners of its location in the factory of the W. S. Burn Mfg. Company.

The Corbin Cabinet Lock Company, New Britain, Conn., will erect a new factory building of reinforced concrete, 28 x 77 ft., two stories and basement, with an ell 30 x 34 ft. The building will be used for a japanning and wood finishing room.

The Trumbull Electric Mfg. Company, Plainville, Conn., is to erect a new building, 50 x 106 ft., four stories. The company is not yet prepared to say what will be required in the way of machinery, outside of the regular shafting, hangers and transmission appliances.

W. O. Bement, formerly superintendent of the Wire Goods Company, Worcester, Mass., has formed a co-partnership with D. W. Gaskill, Blackstone, Mass., under the firm name of Bement & Gaskill. As has been stated in this column, special wire forming machinery will be manufactured in a shop to be erected for the purpose at Shrewsbury, a suburb of Worcester. The building will be a comparatively small one, being intended as a temporary abode of the business during the period of developing the first lot of machines. Later it is planned to build a large, permanent shop.

The Pawtucket Mfg. Company, Pawtucket, R. I., manufacturer of punches, bolts and nuts, is to build a 65-ft. addition to its blacksmith shop. The company has recently finished an addition for general manufacturing purposes.

The Nichols & Langworthy Machine Company, Hope Valley, R. I., manufacturer of engines and boilers, is in the market for flexible multiple drills, punching machinery and boiler rolls to take a sheet from 20 to 22 ft., to roll a drum 42 in. in diameter. The company is finishing up two new buildings, one an extension of the boiler shop, which will be devoted to the manufacture of the Worthington water tube boiler; the other an experimental shop, which will be used for the development of a five-cylinder self-starting gasoline engine, which will be manufactured under the Dock patents. The business is controlled by the New York Safety Power Company, Engineering Building, New York.

The Connecticut Tool Company, Inc., Bridgeport, Conn., manufacturer of adjustable stocks and dies, has made general plans for a new plant in that city, but states that details have not been decided.

The Uncas Power Company, which has been organized at Norwich, Conn., by Congressman Edwin W. Higgins, is to establish an electric power plant on the Shetucket River, 3 miles north of Baltic, Conn. A circular dam 400 ft. long will be built in the spring, which will give a fall of 26½ ft., to develop not less than 1200 kw. The power will be purchased by the city of Norwich, which relieves the necessity of enlarging the local municipal lighting plant. Charles W. Comstock is president, John D. Hall secretary, and Costello Lippitt treasurer.

Another great power project is that of the Spaulding-Jones Power Company, which has a bill providing for incorporation before the New Hampshire Legislature. The plan is to develop a large water power on the Merrimac River, between the mouth of the Souhegan and the head of Moore Falls. The men named as incorporators are Leon C. Spaulding and Roland H. Spaulding, Rochester, N. H.; Huntley N. Spaulding, Boston; Ira W. Jones, Lebanon, Maine, and Stephen A. Frost, Fremont, N. H.

The Consolidated Railway Company, the name given the corporation operating the electric railroad system of the New York, New Haven & Hartford Railroad, is planning to build a line from Adams, Mass., to the summit of Mt. Greylock, the highest peak of the Berkshires, and in fact in Massachusetts. The plan is to build an electric line to the base of the peak and a cog rail line to the summit. As the altitude of Greylock is high above the surrounding country, the building of that portion of the line will be an expensive undertaking. Surveys are being made, and it is understood that a move toward procuring the necessary franchises will be made in the near future.

## Cincinnati Industrial Notes.

CINCINNATI, OHIO, February 5, 1907.

The Lodge & Shipley Machine Tool Company has recently purchased 65 machine tools of different makes with which to supplant those already in use. This will bring the equipment of the plant up to the highest possible efficiency and materially increase the production of the shop. Shop No. 2, known as the Dietz plant, has recently been reconstructed and the equipment rearranged, and is devoted to the manufacture of head and tail stocks exclusively, all being assembled in the main factory.

The Mueller Machine Tool Company, now located at Pearl street, near Elm street, is having plans drawn for a new plant, to be erected on the west side of Colerain avenue, near Draper street. This building will be of brick and steel construction, 60 x 150 ft.

The Bass Foundry & Machine Works, Fort Wayne, Ind., has received an order from the Standard Safety Boiler Company, Chicago, for four boilers of 500-hp. capacity for shipment to Mexico.

J. Clare Miller, who for the past year has represented one of the pig iron selling agencies of this city, returned to his old position with the Columbus Iron & Steel Company, Columbus, Ohio, February 1.

The Cambria Steel Company has moved into its new quarters at 1627 to 1630 Union Trust Building, in this city. The new location is more commodious and much better adapted to the growing demands of the trade.

## Government Purchases.

WASHINGTON, D. C., February 5, 1907.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until March 12 for lathe, bending and straightening rolls, drills, drill press and shears for the Mare Island and Puget Sound navy yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until March 5 for the following machine tools for the Washington and Norfolk navy yards: Schedule 396, grinders, drills, lathe, drilling machine; schedule 397, pneumatic hoists, trolley hoists, turret lathes.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 26 for a speed lathe, bench lathe, portable electric grinders, steam pumps, feed pumps and other supplies for the Eastern navy yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 19 for motors and other supplies for the Mare Island and Puget Sound navy yards.

Bids will be received at the office of the Superintendent, Washington, D. C., until February 25 for three boilers, two elevator pumps and other supplies for the heating, lighting and power plant of the State, War and Navy Department Building.

Under Circular No. 349, the Isthmian Canal Commission will receive bids until February 16 for bending rolls and other supplies.

Bids will be received until March 12 at the office of the Building Committee, United States Department of Agriculture, Washington, D. C., for the power plant equipment for the new building of this Department.

The following bids were opened January 29 for supplies for the navy yards:

Bidder 10, F. S. Banks & Co., New York; 17, Brooklyn Forge & Supply Company, New York; 34, Electric Launch Company, Bayonne, N. J.; 41, Gas Engine & Power Company & C. H. Seabury Company, Consolidated, New York; 48, Richard W. Geldart, New York; 49, Central Metal & Supply Company, Baltimore, Md.; 50, General Electric Company, Schenectady, N. Y.; 65, J. B. Kendall, Washington, D. C.; 68, Frank Libby & Co., Washington; 80, Manhattan Supply Company, New York; 85, Manning, Maxwell & Moore, New York; 88, Motley, Green & Co., New York; 91, National Electrical Supply Company, Washington; 93, New York Yacht, Launch & Engine Company, Morris Heights, N. Y.; 99, J. Edward Ogden Company, New York; 107, Racine Boat Mfg. Company, Muskegon, Mich.; 109, J. B. Roach, Brooklyn, N. Y.; 134, Vermilye & Power, New York; 136, John F. Whalen, Annapolis, Md.; 140, Westinghouse Electric & Mfg. Company, Baltimore, Md.; 148, E. W. Bliss Company, Brooklyn, N. Y.; 151, Holland Launch & Engine Company, Holland, Mich.; 153, Pungs Finch Auto & Gas Engine Company, Detroit, Mich.

Class 11. One 30-ft. gasoline launch and equipment—Bidder 34, \$1985; 41, \$2100 and \$2250; 88, \$3040 and \$3180; 93, \$2500; 107, \$1650; 134, \$1734; 136, \$2000; 151, \$2250; 153, \$2850.

Class 31. One compound wound direct current generator—Bidder 50, \$1615; 140, \$1259.

Class 42. One electric motor—Bidder 50, \$1600; 140, \$1323.40.

Class 68. One power cutter, with elevator bolster—Bidder 148, \$186, \$232, \$258.

Class 99. Ten triplex chain hoists and six differential chain hoisting blocks—Bidder 10, \$489.50; 48, \$518.38; 49, \$584; 65, \$497.60; 68, \$563; 80, \$506.20; 85, \$495.50; 91, \$694; 99, \$471.78; 109, \$620.90; 134, \$461.72.

Class 100. Three stanchion pipe benders—Bidder 17, \$689.88; 48, \$679.14; 85, \$687.

The following bids for supplies for the Isthmian Canal Commission were opened January 29:

Item 1. Six double cylinder double friction drum hoisting engines, with boilers complete, cylinder 7 in. in diameter and 10-in. stroke.

Item 2. Four double cylinder double friction drum hoist-



ing engines, with boilers complete, cylinder  $8\frac{1}{2}$  in. in diameter and 12-in. stroke.

Unit prices unless otherwise given.

The American Hoist & Derrick Company, New York, item 1, \$950, 20 days.

The Thomas Carlin's Sons Company, Allegheny, Pa., item 1, \$930 and \$890, 28 days; item 2, \$1650, \$1398, \$1095 and \$1700 (latter price on 9 x 12 in.), 56 days.

The S. Flory Mfg. Company, Bangor, Pa., item 1, \$940, 35 days; item 2, \$1290, 56 days.

The Lambert Hoisting Engine Company, Newark, N. J., item 1, \$912.50, 4 days; item 2, \$1650 and \$1545, 30 days.

The Lidgerwood Mfg. Company, New York, item 1, \$1026, 17 days; item 2, \$1848, 13 days.

The Mead, Morrison Mfg. Company, New York, item 1, \$920, 28 days; item 2, \$1750 (price on  $8\frac{1}{2}$  x 12 in.) and \$1100 (price on 9 x 10 in.).

J. S. Mundy, New York, total for 10 engines, \$13,180, 56 days.

The Pittsburgh Industrial Iron Works, Pittsburgh, Pa., item 1, \$918, 75 days; item 2, \$1935, 90 days.

The Stroudsburg Engine Works, Stroudsburg, Pa., item 1, \$835, 30 days; item 2, \$1250 (price on 9 x 12 in.), 60 days.

Vermilye & Power, New York, item 1, \$935, 28 days; item 2, \$1118 (price on 9 x 10 in.), 35 days.

George S. Fowler, Washington, item 1, total \$5004, 21 days, and total \$5910, 70 days; item 2, total \$4640 (price on  $8\frac{1}{4}$  x 12 in.), 70 days, and \$4996, 60 days.

The Williamson Bros. Company, Philadelphia, Pa., total for 10 engines, \$11,000, 126 days.

Under Circular No. 345, for two suction dredges for the Isthmian Canal Commission, bids for which were opened January 12, contract has been awarded to the Maryland Steel Company, Sparrows Point, Md., for \$202,500.

The Niles-Bement-Pond Company, New York, has been awarded contract for the two traveling cranes for the Portsmouth Navy Yard at \$18,000.

The following awards have been made for supplies for the navy yards, bids for which were opened January 22:

The Wonham-Magor Engineering Works, New York, class 1, 25 self-dumping steel cable cars, \$7625.

M. T. Davidson, Brooklyn, N. Y., class 46, two vertical single cylinder steam pumps, \$196.

The Taber Mfg. Company, Philadelphia, Pa., class 249, one Taylor-Newbold high speed saw, \$110.

Under bids opened January 15 for supplies for the navy yards the Farnum Sand Blast Company, New York, has been awarded class 113, one sand blast, \$250.

The following awards have been made under opening of January 2 for supplies for the navy yards:

The Garvin Machine Company, New York, class 13, one screw cutting engine lathe, \$1025.

The Smith-Courteney Company, Richmond, Va., class 15, one improved planer chuck, one emery tool grinder, one power saw and one drill grinder, \$213.70.

**Steam Economy in a Rolling Mill.**—A Rateau exhaust steam accumulator and turbine has been installed at the Hallside Works of the Steel Company of Scotland to use the exhaust steam from one high pressure cogging engine with two cylinders, each 40 x 60 in., one finishing train engine with two cylinders, each 42 x 60 in., two small mill engines and four steam hammers, delivering a total of about 41,000 lb. of steam per hour. The power is used for lighting and to drive live rolls, saws, sand blast apparatus and machine tools. The accumulator, which has two compartments, separates from the water any oil carried over, and maintains the water in energetic circulation. It has a diameter of 11 ft. 6 in. and a length of 34 in. The turbine is rated at 700 hp. and has 11 sets of blades, with wheels 40 in. in diameter. It develops its full power at a speed of 1500 rev. per min., and when working at an overload of 10 per cent. the inlet pressure is never over 12 lb. absolute. The vacuum is 28 in. The generator was designed to deliver 2000 amperes, and has carbon brushes and a commutator provided with special ventilating ducts through the center. The ventilation is set up by means of a fan blade attached to each bar. Tests of the unit have shown a consumption of 66.4 lb. of steam per kilowatt-hour at one-tenth load, and with an absolute inlet pressure under 3 lb. per sq. in. At 200-kw. load and an absolute admission pressure of 5.35 lb., the consumption was 42 lb. per unit. At half load and an admission pressure of 8.25 lb. absolute, the steam used was 37 lb. per unit. With a load of 450 kw. and an admission pressure of 11.4 lb. absolute, the figure was 36.6 lb. The vacuum fell during these tests from 28.7 in. to 27.9 in. as the load increased.

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# HARDWARE

THE House Post Office Committee has completed the annual Post Office Appropriation bill, in the preparation of which it has rejected every item of catalogue house legislation offered for its consideration. The measure comes to the House free of "riders" of every description. The action taken represents an important victory for the organized retailers of the country, who have never before taken such prompt and energetic action for the enlightenment of their Senators and Representatives as to the practical effect of the numerous projects put forward by the Postal Progress League and other similar allies of the mail order houses. The letter of our Washington correspondent given on another page goes into the matter at some length, and will be read with interest and satisfaction by the trade.

A decision has just been rendered by Judge Carland of the United States Court, Sioux Falls, S. D., denying the application of a prominent mail order house for a temporary injunction restraining the officers and directors of the South Dakota Retail Merchants' Association and the editor of a business journal in that city from continuing their alleged boycott against the catalogue house. Because some jobbers and manufacturers refused to sell goods to the catalogue house the company alleged that it had been damaged through being unable to purchase the goods required by it to fill the orders of its customers, and accordingly brought suit against the alleged offending parties, as has been duly noted in our columns. The importance of the decision is in the fact that had the plaintiff won in this case there was a general belief that the intention of the company was to institute similar actions in other States where merchants' associations are waging a warfare against the encroachments of the mail order houses. The decision of Judge Carland on this interesting question will be found in full in other columns of this issue.

A correspondent mentions two cases which occurred to a customer within a short time. In one instance he wished for a few pieces of Sandpaper and went to the Hardware store of his neighborhood and paid two cents a sheet for them. The next day he wished a coarser Sandpaper and went to another store which was more convenient for him at the time, and handed two cents to the clerk. One cent was given back to him. He remarked: "I thought the price was two cents a sheet," and was answered, "Sandpaper is a cent a sheet, 10 cents a dozen." In the other instance there was a purchase of cheap Hooks at still another Hardware store. The customer wished one Hook and was charged three cents for it. Having decided that the Hook was what he wanted, he went to the same store, to the proprietor as it chanced, and was charged 10 cents a dozen for the same Hook, the original purchase being shown as the sample. Naturally he complained, and the explanation was not satisfactory. But two cents were returned to him. These are very small matters, but they affect business. Supposing that this customer were to buy a large amount of Hardware, or were to recommend a friend who had such a purchase to make, which merchant would be likely to get the business?

## Condition of Trade.

With mails delayed and traffic of all kinds impeded by the heaviest storm of the winter, the Eastern and Central States are experiencing some of the severe weather which has steadily prevailed in the far Northwest. Some slackening in orders has naturally been felt, but it is believed in manufacturing and distributing centers that this reflects weather and not market conditions. In general it may be said that the compilation of January records has not been attended by disappointing results, and few, if any, complaints are to be heard regarding current orders or the amount of new business which is being placed. Indeed, no little gratification is expressed that business comes in so freely at the prevailing prices, which, of course, mark the high point of a long advancing movement, a fact which certainly indicates that general confidence in the situation remains unshaken. The let up of the first of January, naturally attendant on the holiday and inventory season, has been followed by a decided increase in volume of business which is declared to represent the full normal activity for this season of the year. It is a little easier to get stock in some lines, but there is no evidence that manufacturers of any class of goods are pressing their sale more urgently than in the fall. Prices show fewer important changes, but there is a continuance of the upward movement on some commodities, and the tone of the market is steady to strong. Prospects, at least for the first half of the year, are uniformly pronounced quite as good as in 1906, although it must be admitted that the financial situation is not quite so satisfactory as a year ago. So far most of the trouble has occurred in speculative markets, and there is reason to hope that it may be confined to that quarter. There is, however, little complaint in regard to collections which show an improving tendency.

### Chicago.

Because of a compensating trade balance furnished by the more forward movement of spring goods from Southern and Southwestern points the larger jobbers operating over wide territories have not felt the effects of tightening weather at the North, which has in some sections been severe enough to exert a retarding influence on trade. Growing activity in the demand for Wire Nails and Wire Goods is a measure also attributable to the earlier wants of Southern markets, whose need for replenishment of stocks will soon be urgent. Orders from Northern merchants, however, are being received more freely than would ordinarily be expected at this season of the year. If trade requirements on Wire Nails continue to increase as spring advances, as they reasonably may be expected to do, a scarcity of goods and slower shipments will surely result. A halt seems to have been reached for a time at least in the steady upward march of prices that has for some time been a feature of each week's report. The only late advance of note reported is that on Galvanized Conductor Pipes and Fittings, which have been marked up  $2\frac{1}{2}$  per cent, following the recent advance of Galvanized Sheets. Advances hitherto made are being firmly maintained, and although the general upward movement may still further affect certain lines here and there there is evidently no buying on a large scale by either jobber or retailer in anticipation of such advances.

### Boston

BIGELOW & DOWSE COMPANY.—As usual at stock taking, the question to be decided whether it shall be priced



at market value or at cost is important, and opinions vary. Our custom has been to price stock at its present value. The past year shows very many advances, which have continued for many months, and we know of no system by which the actual costs of the goods on hand can be reached. We do know the present value, and when we use it in pricing we have an actual cost and not a fictitious one.

An objection has been raised that profits are taken before the goods are sold, but this can be remedied by placing any part of the amount gained to a reserve account. Experience teaches that the stock on hand at the commencement of the year is the basis of settlement in case of a fire loss during the year, and no contention with an insurance adjuster that the stock was undervalued would be considered. Many houses have had to decide this question the past month, and it would seem to be an interesting question for *The Iron Age* to bring before its readers.

That the year 1906 has been a profitable one for the Hardware dealers is a foregone conclusion. That prices are being well maintained is an assurance that the trade feels that a higher standard of values is to rule for some time to come. The stand taken by a leading manufacturer of raw material has done much to steady market values and is highly appreciated.

The present situation is unique, and the same skillful mind that has formulated plans that have resulted in satisfactory profits both to the manufacturer and the dealers in Screen Wire and Poultry Netting has it in its power to extend its good work to the Screw situation—and several other lines—where the manufacturers are obtaining good profits and are unable to agree upon a policy that offers a fair profit to the dealers. The trade would appreciate anything that would be done on this line.

The jobbers of New England are maintaining manufacturers' advances, but the retail dealers are inclined to stick to their old prices until they have to replenish their stocks. Under present market conditions this seems a mistaken policy and one that should be remedied. The sooner the trade appreciates the fact that there is a new and a higher standard of values being established, so soon will it better its condition and realize a fit remuneration for its labor. Throughout New England the mills are running full time and labor is fully employed. Surely the conditions at the commencement of 1907 promise much for the present year.

#### New Orleans.

WOODWARD, WIGHT & Co.—We have all noted Mr. Hill's statement that it is not car shortage that is bothering us, but lack of trackage to move the cars on, and that it is practically impossible for us to lay rails enough to make up for this shortage. This looks to us as if the old Creole dream might come true, which had New Orleans as the greatest port in the country, and which around 1840 was beginning then to materialize. At that time this city was the second port in the United States, and at the present moment New Orleans is the second port in the United States as far as exports are concerned. If now we should succeed in getting, not the 14 ft. of water Congress has been asked for, but, say, only 10 ft. of water in the Mississippi River from St. Paul, and from Chicago down past St. Louis and Cairo, the question of transportation then as far as we are concerned would practically be solved for good and all and the old Creole dream of the second city in the country might be passed entirely. There are some dead statisticians who prophesied that New Orleans would be the metropolis of the United States, if not of the world. And when you come to think of it, if the Mississippi Valley ever wakes up to the real condition of the case and insists on getting its rights with a 10 or 14-ft. channel—it does not matter much which—the whole producing part of the country can get to salt water cheaper by the Crescent City than by any other possible means. It is simply a question like that of the operation of the ore railroads in Minnesota; there it boils down to how many empty cars a locomotive can haul back from the boats to the mines; in this case

it will be how many model barges can one tug tow back to St. Paul, Chicago, St. Louis or Pittsburgh.

When you come to think of it, we have a 4-mile current working steadily to put the products of the farmers, the coal, steel and iron workers and various other busy people between the Rocky Mountains and the Allegheny, at the seaboard for nothing. We have neglected too long entirely the care of our waterways, and if this present congestion on the railroad tracks will awaken the Mississippi Valley to the real situation it will be well worth the trouble and inconvenience we have all suffered in the past few months. We have all gotten it into our heads somehow or other that the only possible economical way of moving freight is to roll it into a freight car and send it along a specially built and horribly expensive roadbed, which costs \$30,000 to \$50,000 per mile and which requires a foreman and three or four men every 6 miles to keep it in shape and an innumerable host of clerks and telegraph operators to keep some of the trains out of collision. Yet we have here at a very minimum of expenditure a means of communication with the seaboard in which practically all we have to do is to put the goods on the barge and let the Mississippi River do the rest. The trouble is it has all been too easy. There has been no exclusive right of way to require any tremendous expenditure and no chance to make tremendous profits, but simply to make a decent and fair one.

It is just a shade easier to get stocks in some lines. The car shortage does not seem to be any easier here than it was before. Collections are coming in very decently, and good sized new year's orders. We are all a little worried about the stage of the Mississippi River, and the levees have not been tested for a good many years with a big bank full of river between them. The engineers, however, say that everything is all right and with very little possibility of any breakage in the southern part below Memphis.

Money rates continue high in this section, and while we hear of 6 per cent. money being the custom in Chicago, it is not so down here by any means.

#### Baltimore.

CARLIN & FULTON.—Since our last letter there has been but little change in the situation, and very little that is new to write about. The demand for goods still continues active, and the month of January has no doubt throughout the entire country compared most favorably with the corresponding month of a year ago. The open winter has stimulated trade beyond the expectations and preparations of the manufacturers. There is the usual complaint as to lack of transportation facilities with the consequent delay in the delivery of many staple goods and the congestion in shipment of all wire products.

With some few exceptions resulting from short crops, owing to the heavy rains of last summer, trade conditions are excellent, and we may look for a continued activity in business.

#### Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—January has hardly developed any new features especially peculiar to itself, in the field of traffic. Trade started in the new year where it left off in the old, and has moved steadily along at an encouraging pace, and if it proves to be a stayer as indicated by the prevailing conditions, there will be no cause for complaint on the part of jobbers of Hardware. Numerous advance orders have been booked for present and later delivery, showing that the trade generally feel assured of the coming spring business; at the same time they are equally confident that the present scale of values will be maintained. There appears to be a sufficiency of money in the Trans-Missouri region, and the present enhanced prices do not appear to effect or check the general demand.

Owing to the scarcity of raw material some manufacturers are very slow with deliveries. There is also a great deal of difficulty with transportation facilities, causing numerous and vexatious delays of goods in transit, attributed to a shortage of trackage and motive power.

The time when spring business will be the leading feature of the condition of trade is approaching, and both jobbers and retailers feel confident that an abundance of business will appear as soon as the winter season shows signs of departure.

#### Cleveland.

**THE W. BINGHAM COMPANY.**—Activity in all lines of general Hardware, Mining, Milling and Manufacturers' Goods seems to be the order of the day. Spring goods on orders that were placed last fall are now going forward, such as Lawn Mowers, Shovels, Spades, Scoops, Ice Cream Freezers, Field Hoes, Garden Rakes, Hay and Manure Forks, Step Ladders, Screen Wire Cloth, Poultry Netting, Screen Doors and Windows and many other seasonable goods. Those who bought early and took the goods in stock will have a lot of low priced goods to offer their customers in the early spring.

Revision in prices on many goods is constantly being recorded. The manufacturers, however, seem to be moderate in their advances, being contented to advance prices on goods only when the cost of raw material and advance in labor oblige them to do so. If one will analyze these advanced prices one can readily see why they are made. The demand and consumption on all kinds of goods keep up and everything portends an immense spring trade.

The demand for Merchant Pipe, Cast, Malleable and Brass Fittings and Mechanics' Tools is good, and some of these lines the manufacturers are unable to supply promptly.

Stocks in the hands of jobbers, however, are very good, and now that the inventory of stocks is about over merchants would do well to look up their wants and put their orders in early. Shovels, Spades, Scoops, Screws, Hinges and Enameled Ware are still a good purchase at present prices; also Builders' Hardware and Mechanics' Tools.

#### St. Paul.

**FARWELL, OZMUN, KIRK & Co.**—Business conditions in the Northwest have been affected considerably by the unfavorable winter. This winter has thus far been one of the old fashioned sort and in the northern territory railroad travel and traffic have been seriously interfered with. There are many branch lines that are used as feeders to the main lines, and on these many farming communities and also towns have sprung up which have been shut off from railroad communication for the past 30 days. It is quite uncertain as to whether these roads can be opened and kept open to any considerable extent until the backbone of the winter has been broken, which may not be until some time next month. The railroads are hard at work with the problem and are keeping the main lines open to a considerable extent and are also giving the branch lines such attention as they are able to give. There will be some suffering in a number of communities, but it is expected that the consequences will not be serious unless the weather should prove more unfavorable than is now hoped for.

There has been no such winter in the Northwest as this one for the last 18 or 20 years. There is a great body of snow on the ground and the probabilities are that it will remain until toward spring, and, if so, the cold weather may be expected to continue. In the territory in the latitude of St. Paul the storms have not been unusually severe and the winter has been very comfortable and satisfactory, but it is not so in the more northern territory. Business will necessarily be reduced in that territory until the conditions change, and the probability is that it will come in a heap when the embargo is lifted. Otherwise the general conditions are favorable and the prospects for spring business are good.

#### Nashville.

**GRAY & DUDLEY HARDWARE COMPANY.**—The first mile post of the year 1907 has been passed, and we believe that the Hardware man's hopes so far have been realized. Business has certainly been quite satisfactory for the month of January. The weather in the main has been unusually warm and favorable for outdoor work,

and farm work, building, mining, manufacturing, &c., have been carried on more extensively than is usually the case in the month of January. The demand for Hardware hasn't often been better than it is at the present time.

Prices are being rapidly advanced, and we are beginning to have some fears that manufacturers are going to get prices so high that the consuming public will economize in the matter of their requirements, and thus cause a decrease in the amount of goods handled and consumed. We cannot say that such a condition would not be healthy. While the country is phenomenally prosperous the results of this prosperity should be distributed as nearly equal as possible. In the distribution of these good things we should ever have in mind the motto of our President—A square deal for everybody under all circumstances and conditions.

We think pig iron is higher than it should be, and some of the finished product is being advanced more rapidly than we would advise. While trade and collections are now good, we do not believe that this policy of rapid advances is conducive to good trade in the future, and are of the opinion that these are matters which should receive the careful consideration of manufacturers.

#### Philadelphia.

**SUPPLER HARDWARE COMPANY.**—The year 1906 ended we think with a trade record of having exceeded previous years in general business activity. There are, however, no matter how general trade conditions may be, certain defects which could be corrected, providing those high in authority fully realized that even increased trades does not always guarantee sufficient increase of profits to overcome neglect or carelessness in conducting business or permit indulgence in outside speculation. Financial conditions indicate this has been indulged in during the past year by some who are actively engaged in trade.

Passing from these points, we all realize the cost of living has greatly increased, which not only extends to those who have their own business but all those who are in their employ, and it has been admitted by those in certain lines of trade that extravagance has largely increased, and during the 30 or 60 days preceding last Christmas millions upon millions of dollars over any previous year were spent. In this doubtless many people were temporarily made happy, but in many cases may it not have been that after it was all over shortage of money reversed the feeling. Referring to the millions of dollars' worth of imports that were sold during the three months prior to Christmas, is it not possible that some of these purchases may have been the cause of some of the recent failures as well as the reports of slow trade collections?

We find some in the trade occasionally making use of the expression "abnormal general business." We do not feel so. The general prosperity of the country during the past few years has brought certain results; no one, however, can tell or estimate how long they will continue. The year 1907 opens with a continuation of good sales, some manufacturers state in excess of January one year ago. One manufacturer stated to us his trade was never so large within thousands and thousands of dollars in the months of December and January, all calling for immediate shipment. We find several manufacturers thus early in the season are behind promised shipments, which certainly necessitates jobbers ordering goods early and practically in advance of immediate wants as well as to provide for immediate funds, that they may have them on hand when goods arrive, as quick payments are essential if jobbers expect to make any net profit.

We think the retail trade generally have overcome their fear that manufacturers' advances in prices on Hardware during the year 1906 might again fall back in the year 1907. The fears of salesmen have also been largely overcome, and they are largely overlooking the reports that so and so sold these goods at so and so within the last 30 or 60 days. Why of course they did, and manufacturers did not publish the statement that



they would make advances in 30 or 60 days to so and so, but named the advanced prices at once. It is not to be wondered at that manufacturers are overrun with orders in excess of previous years, nor can the advances in prices be criticised to any great extent. The exports during 1906 exceeded those of any previous fiscal year. We admit that the imports have also largely increased, but the reports are that the exports exceeded the imports over \$475,000,000, although it had been estimated that they would exceed them \$500,000,000 before the large imports during the last few months of the year reduced the difference a small amount. Yet the exports of wheat were a trifle smaller than they had been for a few years. This is largely owing, of course, to the increase in population and our own requirements each year, as well as the excess in use in proportion to the population. The manufactures' increase in exports were over \$75,000,000 in excess of the previous year and the export of cotton about \$20,000,000 over 1905, although less than in 1904. The anxiety of a few months ago in the cotton districts has been lessened in some locations, although there are still sections where the disappointment continues. The apprehensions of some persons we fear were enlarged by the newspaper articles, which are not always understood. We must realize that really over two-thirds of the cotton raised in the world is raised in our own country, and nearly two-thirds of our own cotton crop is exported. We, of course, would all be glad if the South could increase its manufactures, and then we could export largely manufactured product and use it also in our own country, instead of exporting the cotton and importing the goods back, although manufacturing have increased during the prosperity of the last few years, notwithstanding some inconvenience suffered from want of help.

A prominent and intelligent president of a Western railroad (so it has been reported) recently stated that it would require \$1,000,000,000 a year for five years in order to provide for the requirements of railroad transportation. This certainly indicates the prosperity of the last few years. How long it will continue we cannot tell, we hope for years to come, but care should be taken in conducting business, and speculation by those in business should be well considered before making investments. That should be left in the hands of speculators, not indulged in by business men.

### St. Louis.

**NORVELL-SHAPLEIGH HARDWARE COMPANY.**—How time flies! One month of the year gone. Notwithstanding the unseasonable weather, January has been an excellent month. Goods shipped and billed show a heavy increase over the same month last year.

On account of changed conditions, jobbers' profits on certain staple spring lines should be much better than last year. Generally speaking, we can report prices on Wire Cloth, Screen Doors, Poultry Netting and other spring goods are being very well maintained by jobbers. It seems to be generally understood among jobbers that certain manufacturers do not propose to stand for indiscriminate price cutting on their lines. Jobbers appreciate the fact that manufacturers can punish them by withholding shipments. A retail merchant who buys a car lot of Nails and Wire at a cut price from some jobber selling on an old contract may become somewhat impatient waiting for his goods to arrive.

It seems most jobbers have adopted advances promptly. It is a question, however, whether the retail trade are benefiting to the same extent from the advances that have taken place. For many reasons it is more difficult for them to advance their selling prices.

Here again the catalogue houses stand in the way of the retail dealer obtaining the advances to which he is entitled. As catalogues are issued only semiannually, regardless of changed costs, catalogue houses continue to fill orders at old prices. Even in those cases where the catalogue houses have agreed with the manufacturers to advance their selling prices, such advances will often not take place until their next catalogue is issued—six

months in the future. In the meantime they continue to flood the country with catalogues priced at old figures.

Certain advances that were promised on important lines of goods have not materialized. Those on the inside are wondering about the cause of the hitch in the proceedings. Observers are interested in the fact that of two large manufacturers, one sent out their salesmen predicting an advance, while the other smiled wisely, but was noncommittal. The advance did not materialize. Now we wonder what happened behind the veil.

Wall Street seems to have something very heavy on its stomach. We see the symptoms of the trouble and we wonder at the cause. In the meantime rates for money continue high.

Natural conditions in almost every section point to a very good business the first half of this year. Still there seems to be something ominous hanging in the air—some unexplained fear. Probably some of us are not used to the "dem'd prosperity," and it will take us a little time to become accustomed to it. Perhaps in many directions money has been made so easily and has come in such big chunks some of the earners of the money are afraid of their unearned increment. When a man has worked hard a good many years and made only a reasonable amount of money, there is something a little uncanny and weird having it come so fast.

Please understand, however, we are not speaking from personal experience, but simply in an effort to analyze present conditions.

### Louisville.

**BELKNAP HARDWARE & MFG. COMPANY.**—We feel after the subsidence of the waters as though we had emerged from an old time flood. Our concrete ark rode the waves very much like a thing of life, with pulsating pumps in its cardiac region going night and day. The rainfall within a few days of something over 8 in. was responsible for this overflow. There was no snow, neither was the ground frozen; but simply more water flowed into the basin of the Ohio and its tributaries than could be swiftly carried off by natural gravitation, as the Rogers Brothers express it. Familiar landmarks disappeared as the water crept up, and steamboats steered away over the top walls of the canal. The falls were completely obliterated. At one time the City Engineer pronounced one-seventh of the city to be under water. Rubber boots were *de rigueur* in our most fashionable business streets, and automobiles gave way to skiffs and punts. Big sycamore logs floated up to our front doors, and those who enjoy gathering driftwood on shores had ample opportunity to indulge their speculative propensities. The more daring souls who put out from the shore in skiffs were said to have made quite a handsome thing out of the flotsam which must have come down from Ohio and West Virginia.

Altogether it was a very trying time and by far the the most extensive flood since 1884. Unfortunately, we could not absorb the loss as we did the wet and have done with it. The same muddy water which washed into second story windows at the foot of Fourth street has gone on down stream to Evansville, Memphis and the lower Mississippi, just as wet, cold and destructive as it was nearer headwaters.

The first month in the new year, in spite of this drawback, has proved encouraging in volume and general business features. There is talk of the subsidence of demand. Whether people think this to be according to Mother Shipton's prognostications, or Benner's Prophecies, or the Nautical Almanac we cannot say, but people are buying goods freely and are amply able to pay for them. The railroads can hardly carry the passengers and freight offering for transportation. Nobody is discouraged; failures are few. If any body wants to gamble on these points as indicating adversity, he is welcome to do so. There is always the danger of too much legislation, and just now those who stand highest in political matters seem to be more interested in telling the President what he should not do than caring for their constituents. The utterances of the Gridiron Club seem to have almost the same weight as if made in the Senate chamber.

## Portland, Oregon

**FAILING, HAINES & McCALMAN.**—Our trade is remarkable for this time of the year. This is true not only of this house, but is the common story of every house in this territory. Business is much better than at this time last year, and then we thought that we were doing about as well as could be expected. Local firms have orders on file for delivery as late as May and June, but we hate to say that they will be supplied on time as we cannot count on receiving goods from the factory. This is, of course, accounted for by the excessive demand and the inability of the factory to increase its capacity as rapidly as we would wish. The car shortage and lack of motive power on the railroads has a very large effect on business here. Were it not for these drawbacks we would have an even better story to tell, though it hardly seems possible. There has been a large increase in building activity and in railroad construction. This, of course, is one of the causes of the prosperity of the Hardware business. There was never as much construction work in Portland as at the present time, and a large part of this demands more Hardware than the construction formerly used in this part of the world. There is no sign of a lull in this building activity, and if Mr. Harriman does not gobble up Mr. Hill, or vice versa, the railroad activity will continue for two or three years more.

There is an extraordinary influx of settlers into this country. The fair of 1906 here attracted many new people to this country and every one seems to have brought his friends out to make a home for himself in this comparatively new territory. This has caused a tremendous increase in Shelf Hardware and similar lines. The general opinion seems to be that this increase is at least 40 per cent. over that of this time last year.

General conditions for the retail Hardwareman were never better than they are at present. There is a spirit of co-operation among the retail dealers, which is helping each one of them to do a better business than he ever did before. The whole trade seems to have money. The credit conditions could not be very much better, as about as high as 60 per cent. of the trade are discounting their bills and the remaining 40 per cent. are paying promptly at maturity.

I have been noticing some discussions about the parcels post and other proposed extension of the postal system of the country, to take over the business of the express companies and banks, and it seems to me that while we are going at it right in one way in agitating with our representatives in Congress against these proposals, both personally and by association resolutions, we ought to be able to get at the agitators in another quarter. We have noticed that a good many illustrated weekly papers in the country apparently favor parcels post and postal checks. We can bring the editors and proprietors to see the error of their ways by showing them that such a move will benefit only mail order houses and catalogue houses who do not advertise with them and will hurt the manufacturers who advertise with them. It seems to us that if every man who advertises in any paper in the country that favors either of these schemes would reason with the proprietors and editors it could not help but be of some benefit. Every newspaper owner is more or less susceptible to the arguments and influence of large advertisers, and this is as true of the man who runs a large city paper as of the man who runs a weekly paper in a small town. This probably has been suggested before, but I never have seen it and it seems to me that it might be a good way to take up the work, at the same time keeping up the direct appeals to our representatives in Washington.

## NOTES ON PRICES.

**Wire Nails.**—Market conditions remain practically unchanged, except as the recent floods and severe weather in some parts of the country have to a certain extent curtailed the production of mills and interfered with the regular movement of trade. Demand, including contract and new orders, keeps about even with productive capacity, and jobbers are now receiving Nails that were or-

dered 60 days ago. The larger proportion of the mills have their product sold up for some time to come. The market is firm, with reports of premiums being asked by some of the independent mills. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers .....\$2.00  
Carload lots, to retail merchants..... 2.05

**New York.**—Inclement weather has caused a perceptible falling off in the moderate demand which has characterized the market recently. Under present conditions the market is satisfactorily maintained. New York quotations are: To retailers, carloads, on dock, \$2.19; less than carloads, on dock, \$2.33; small lots, at store, \$2.30.

**Pittsburgh.**—While new demand for Wire Nails is lighter than for some time, most of the leading mills have their product sold up for the next 60 to 90 days, and are still very much behind in deliveries. The heavy snows and the inclement weather of the past two weeks have interfered not only with output, but also with shipments, and the mills are not catching up on deliveries to any extent. We are advised that several of the mills are quoting Wire Nails at \$2.00, which is an advance of 10 cents per keg over official prices. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....\$2.00  
Carload lots, to retail merchants..... 2.05

**Cut Nails.**—Stocks held by the mills are light, especially on certain sizes, and some mills refuse to accept export orders for delivery earlier than April 1. The mills are running largely on contract specifications, while new business is only fairly large. The market is firm. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

**New York.**—The market is quiet and without any particularly interesting features. Jobbers' quotations are on the basis of \$2.30 for small lots at store.

**Pittsburgh.**—Only a fair amount of new tonnage is being placed, the Cut Nail mills running mostly on specifications on contracts, which are coming forward very freely. We are advised that one or two mills that have their product sold up for some time ahead are asking slight premiums over official prices. The car shortage has been further augmented by the heavy snows of the past two weeks, and the mills have not been able to catch up on deliveries. The market is firm, quotations being as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

**Barb Wire.**—A large amount of Barb Wire was contracted for previous to the last advance in price, and specifications on these contracts are coming in freely. Prompt shipments are urged by jobbers so that they may be able to meet the requirements of retail merchants promptly when spring demand commences. New business is comparatively light. The tone of the market continues strong, and it is understood that some mills are asking premiums over regular prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

**Pittsburgh.**—New business is very light, but buyers are insisting on prompt shipments on specifications, the mills being considerably behind in deliveries. In fact, some of the mills are so far back on orders that they are not entering any new business except at premiums over official prices and for indefinite delivery. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:



	Painted.	Gal.
Jobbers, carload lots .....	\$2.15	\$2.45
Retailers, carload lots .....	2.20	2.50
Retailers, less than carload lots .....	2.30	2.60

**Smooth Fence Wire.**—New demand is only fair, but buyers are specifying freely on contract orders, of which mills have a large tonnage on their books. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads .....	\$1.85
Retailers, carloads .....	1.90

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base.	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized.....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15	

**Pittsburgh.**—While new tonnage is light, specifications on contracts continue to come forward very freely, and the mills are still much behind in deliveries. The car shortage is still being severely felt, the inclement weather of the past two weeks having retarded movement of cars. The market is firm, and we are advised that one or two mills are asking premiums over official prices for forward delivery. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads .....	\$1.85
Retailers, carloads .....	1.90

The foregoing prices are for base numbers, 6 to 9.

**Conductor Pipe and Eaves Trough.**—The advance in Sheets referred to under this head in our issue of a week ago has been followed by a 2½ per cent. advance in Galvanized Steel and Charcoal Iron Pipe, Trough, &c. Following are the discounts recommended to the jobbing trade, including the new prices on Copper lines which we reported last week:

	Territory.			
	Eastern.	Central.	Southern.	Western and South-western.
	Per cent.	Per cent.	Per cent.	Per cent.
<b>Conductor Pipe:</b>				
Galvanized Steel, standard sizes and gauges.....70		65-10	65-5	50-25-2½
Galvanized Steel, irregular sizes and gauges.....70-10-5		70-10	67½-12½	65-10
Galvanized C. C. Iron, standard sizes and gauges.....50-17½		55-2½	50-7½	50
Galvanized C. C. Iron, irregular sizes and gauges.....70-10-5		70-10	67½-12½	65-10
Copper, 14, 16 and 20 oz..30		20-10	20-7½	20-5
<b>Eaves Trough:</b>				
Galvanized Steel, standard sizes and gauges.....70-30		75-10-2½	75-7½	75
Galvanized Steel, irregular sizes and gauges.....75		70-12½	70-5	65-10
Galvanized C. C. Iron, standard sizes and gauges.....70		65-10	65	60-10
Galvanized C. C. Iron, irregular sizes and gauges.....75		70-12½	70-5	65-10
Copper, 14, 16 and 20 oz..30		20-10	20-7½	20-5
<b>Miter, End Pieces and Drops:</b>				
Galvanized Steel.....35		35	35	35
Galvanized Charcoal Iron.....List net.		List net.	List net.	List net.
<b>Plain Ridge Roll and V. Ridge Cap:</b>				
Galvanized Steel.....80-5		80	75-12½	75-5
Galvanized C. C. Iron.....70-7½		70	65-5	60-10
<b>Formed Valley:</b>				
Galvanized Steel.....70-2½		65-12½	65-5	60-10
Galvanized C. C. Iron.....50-17½		55	50	40-10

**Shot.**—Under date of February 1 the following prices representing an advance of 5 cents per 25-lb. bag were announced on Shot:

Drop Shot, sizes smaller than B, 25-lb. bags, \$1.95 per bag; 5-lb. bags, 45 cents per bag.
Drop Shot, B and larger sizes, 25-lb. bags, \$2.20 per bag; 5-lb. bags, 50 cents per bag.
Buck and Chilled Shot, 25-lb. bags, \$2.20 per bag; 5-lb. bags, 50 cents per bag.
Dust Shot, 25-lb. bags, \$2.40 per bag; 5-lb. bags, 55 cents per bag.

On ton lots and over there is the usual discount of 10 cents per bag of 25 lb.

**Smith & Hemenway Company.**—Smith & Hemenway Company, 108-110 Duane street, New York, states that advances of from 10 to 15 per cent. have been made in a number of the lines made or controlled by the com-

pany, including Nail Pullers, Glass Cutters, Electrical Tools, Linemen's Connectors, Climbers, Comealongs and Screw Drivers.

**C. A. Peck Hardware Company.**—C. A. Peck Hardware Company, Berlin, Wis., manufacturer of the Gem and Jewell Rural Mail Boxes, announces an advance of 50 cents per dozen on the Gem and 25 cents per dozen on the Jewell line. Owing to the increased cost of sheet metal, the company makes this change rather than reduce the quality of its product. Prices on the company's Automatic Trucks and Gem Sliding Barn Door Latches remain the same.

**Rollman Mfg. Company.**—It is announced by Rollman Mfg. Company, Mount Joy, Pa., maker of Rollman Food Choppers, Potato Cutters and other Kitchen Specialties, that prices on several lines have been advanced 5 per cent. to partially cover the increased cost of raw material.

**Flax Goods.**—Quotations on lines of Flax Goods handled by the Hardware trade, including Twine, Packing, &c., have advanced from 1½ to 2 cents per pound.

**Wooden Ware.**—A number of leading manufacturers of Wooden Ware, such as Slaw and Kraut Cutters, Money Drawers, Hat and Coat Racks, &c., have revised their prices. Advances amount to 10 per cent. or more.

**Sash Cord.**—The market for Sash Cord is characterized by heavy demand, under which prices naturally exhibit noteworthy firmness. Reports from several manufacturers are to the effect that they are getting all the business they can handle.

**Revolvers.**—Manufacturers of Revolvers state that the advance recently made has been well received by the trade and has not had the effect of reducing the volume of business. The advance, it will be remembered, amounted to 15 cents a piece on Double Action and 25 cents on Automatic Revolvers of the competitive grade, which may be quoted in a general way on a base of \$2 and \$3.75, respectively.

**Magnesia Pipe Coverings.**—Manufacturers of asbestos materials have advanced the price of Magnesia Pipe Coverings to 20 per cent. discount, the former price having been 30 per cent. off list. This puts the discount back to about what it was several years ago.

**S. G. Monce.**—S. G. Monce, Unionville, Conn., manufacturer of Monce's Novelty Glass Cutters, &c., states that owing to the extensive advance in brass he has been forced to ask moderately higher prices for his Interchangeable Lock Stencils.

**Steward & Romaine Mfg. Company.**—Steward & Romaine Mfg. Company, Philadelphia, manufacturer of Expansion and Toggle Bolts, announces that on January 15 prices were advanced 5 per cent. on its entire line.

**Wire Goods Company.**—A new discount sheet, No. 26, has been issued by the Wire Goods Company, Worcester, Mass. It covers the whole of the extensive line made by the company and represents advances on numerous items handled by the trade. Moderate concessions from the quotations published in this sheet may be secured by different classes of buyers.

**Rope.**—A fairly good demand, for the season, is being experienced by manufacturers. Prices remain unchanged and are generally being adhered to. Quotations are as follows: Pure Manila, 13 to 13½ cents; B quality, 12 to 12½ cents; Pure Sisal, 9¼ cents; No. 2 quality, 7¼ to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

**Window Glass.**—Notwithstanding reports in the daily press that Window Glass manufacturers had agreed to close down their factories until September, no such agreement has been entered into. At the meeting of Window Glass manufacturers held last week, the matter of regulating supply to demand was placed in the hands of the manufacturers' wage committee, which is to decide when closing down the plants will be expected. It may be that the factories will be closed down in May. According to reports the trade is not particularly active in placing orders at the present time. Quotations for carload lots are as follows: Single strength, 90 per cent.; double

strength, 90 and 5 per cent. discount from manufacturers' list. Local demand is light and jobbers' quotations, from jobbers' list October 1, 1903, are as follows: Greater New York, 90 and 10 per cent. discount for all sizes, single and double strength; outside of Greater New York, 90 and 5 for single and 90 and 10 per cent. discount for double strength Glass.

**Linseed Oil.**—It is claimed that the present price of Oil is 2 or 3 cents lower than Seed prices justify, and that if there was any considerable demand Oil prices would be advanced. According to some in the trade large buyers covered their requirements for the next three or four months on the basis of 35 to 38 cents per gallon, and that renewed buying in large quantities is not likely to begin until these contracts are about to expire. Demand is light and confined to small lots. New York quotations for jobbing lots are as follows, according to quantity: City Raw, 42 to 43 cents per gallon; Out of Town Raw, 40 to 41 cents per gallon. Boiled Oil is 1 cent a gallon over Raw.

**Spirits Turpentine.**—Local demand is light, but the market is strong and advancing in sympathy with conditions in the South, where buying has been active and offerings light. New York quotations are as follows, according to quantity: Oil Barrels, 74½ to 75 cents; Machine Made Barrels, 75 to 75½ cents per gallon.

## Retail Hardware Conventions.

*During the next month or two the following retail Hardware conventions will be held. Where special arrangements have been made for Hardware exhibits by manufacturers and jobbers the fact is noted:*

**NORTH DAKOTA RETAIL HARDWARE ASSOCIATION.** Meeting postponed until further notice. Secretary, C. N. Barnes, Grand Forks.

**WEST VIRGINIA RETAIL HARDWARE ASSOCIATION,** Clarksburg, February 12 and 13. Secretary, J. H. Krepps, Morgantown.

**PENNSYLVANIA RETAIL HARDWARE ASSOCIATION,** Pittsburgh, February 12, 13 and 14. Headquarters, Monongahela House. Secretary, J. E. Digby, McKees Rocks.

**SOUTH DAKOTA RETAIL HARDWARE ASSOCIATION,** Mitchell, February 12, 13 and 14. Hardware exhibition. Secretary, Noah Keller, Woonsocket.

**OREGON RETAIL HARDWARE AND IMPLEMENT DEALERS' ASSOCIATION,** Portland, February 13 and 14. Secretary, Henry J. Goff, Forest Grove.

**COLORADO RETAIL HARDWARE ASSOCIATION,** Denver, Albany Hotel, February 13, 14 and 15. Secretary, Adolph Unfug, Walsenburg.

**ILLINOIS RETAIL HARDWARE ASSOCIATION,** Chicago, February 14, 15 and 16. Headquarters, Lexington Hotel, meeting and Hardware exhibition at Coliseum. Secretary, Leon D. Nish, Elgin.

**CONNECTICUT HARDWARE ASSOCIATION,** Hartford, February 20 and 21. Secretary, J. De F. Phelps, Windsor Locks.

**NEW YORK STATE RETAIL HARDWARE ASSOCIATION,** Syracuse, The Alhambra, headquarters the Yates, February 19, 20, 21 and 22. Hardware exhibition. Secretary, John B. Foley, Syracuse.

**IOWA RETAIL HARDWARE ASSOCIATION,** Des Moines, February 19, 20, 21 and 22. Headquarters, Savary Hotel; Meeting at Christian Church auditorium; Hardware exhibition at Shriners' Temple. Secretary, A. R. Sale, Mason City.

**INDIANA RETAIL HARDWARE ASSOCIATION,** Indianapolis, February 20, 21 and 22. Hardware exhibition. Secretary, M. L. Corey, Argos.

**OHIO RETAIL HARDWARE ASSOCIATION** Columbus, February 26, 27 and 28. Headquarters, Southern Hotel. Hardware exhibition at Memorial Hall. Secretary, Frank A. Bare, Mansfield.

**MINNESOTA RETAIL HARDWARE ASSOCIATION,** St. Paul, Knights of Columbus Hall, February 26, 27, 28, March 1. Hardware exhibition. Secretary, M. S. Mathews, Boston Block, Minneapolis.

**CALIFORNIA RETAIL HARDWARE ASSOCIATION,** Los Angeles, March 20, 21, 22. Secretary, F. B. Dickson, 1011 Market street, San Francisco.

## ASSOCIATION NOTES.

G. R. Lott, 1002 West Lake street, Chicago, who is manager on behalf of the Illinois Association of the Hardware Show which will be held in connection with the annual convention in that city February 13-15, has sent out a circular in which important shipping directions are given for the benefit of the exhibiting manufacturers and jobbers. The association has made arrangements with teaming companies to deliver shipments to the Coliseum on Monday, February 11, when possession of the building will be taken.

No dates have yet been selected for the postponed meeting of the North Dakota Association on account of the severe weather prevailing. The **North Dakota** officers are waiting for a favorable turn in the weather conditions which will permit the railroads to run their trains with some degree of regularity.

Every foot of exhibit space at the Alhambra, Syracuse, has been taken by manufacturers and jobbers for the coming meeting of the New York Association, February 19-22. The exhibits will have the full **New York** attention of the visiting merchants in the morning and evening, the business sessions of the convention occurring in the afternoon. A special railroad rate of a fare and a third for the round trip has been arranged for on all roads of the Trunk Line Association.

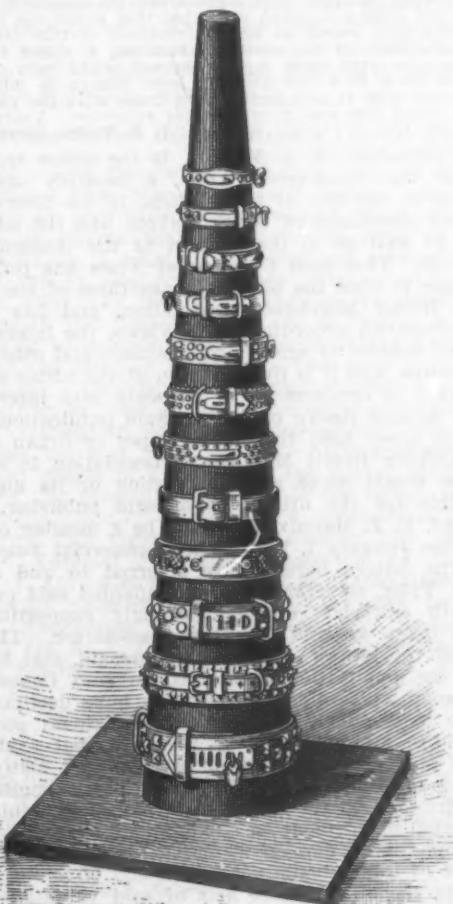
A very interesting programme has been prepared for the meeting of the South Dakota Association at Mitchell, February 12-14. There will be formal addresses by William M. Pratt of the Goodell-Pratt Company, Greenfield, Mass., on "The Evolution of the Hardware Trade"; J. H. Roper, Parker, S. D., on "Office System," and Geo. M. Evenson of the Knapp & Spencer Company, Sioux City, Iowa, on "Salesmanship." S. R. Miles, first vice-president of the National Retail Hardware Association, will also be present and make an address. There will be a good deal of general discussion on matters of practical interest, including the question of pure Paint. Some of the Question Box topics are as follows: "Are Stove Prices Too High?" "Does It Pay to Give Presents to Customers?" "Does It Pay to Borrow Money to Discount Bills?" "Does It Pay to Weigh Freight and Check Freight Bills?" "Do 5 and 10-Cent Counters Pay?" and "Does It Pay to Confine Purchases to a Few Houses?"

**THE UNION HARDWARE & METAL COMPANY,** Los Angeles, Cal., has just closed its most successful year in business. The company has materially enlarged its facilities, and is now located in its new building covering an entire block on First and Alameda streets. The annual dinner of the company to its sales department, given at Levy's Café on December 28th, was a most enjoyable affair. A feature of the occasion was an address by the company's manager, L. C. Scheller, in which he referred at length to the business of the company and its development. The business was established 24 years ago under the name of Schoder, Johnson & Co., with a capital stock of \$200,000, which has been increased from time to time until now it amounts to \$1,500,000. Its new building has exceptional trackage facilities for the economical handling of freight and contains 4½ acres of floor space with an adjoining yard of 3½ acres. The company's operations cover the Southern portion of California as well as Arizona and Nevada.



## DOG COLLARS DISPLAYED IN WINDOW.

THE cone on which dog collars are displayed, shown in the accompanying cut, has been the means of selling a large quantity of dog furnishings. The device is simple and inexpensive, yet shows off the various sizes of collars to the best advantage, and in so striking a manner as to catch the eye of passers-by, when displayed in a show window. The cone is made of tin, flanged on the bottom so as to fasten it to a board. The cone is 38 in. high, 8 in. in diameter at the bottom, and 2 in. at the top. The board to which it is fastened is 16 in.



*Cone for Displaying Dog Collars.*

square. The cone and board were covered with black cloth, that on the cone being cut to the right size and then run up on a sewing machine. This device has recently been made by White & Son, 30 South Fourth avenue, Mt. Vernon, N. Y., and used for display purposes in one of their show windows.

## TOOLS AND THEIR USES.

AMERICAN FORK & HOE COMPANY, Cleveland, Ohio, has issued an attractive booklet, entitled "Tools and Their Uses," which is intended for distribution to customers. The booklet will also be furnished to merchants for distribution among their customers. It is gotten up in attractive form, treating of the manufacture of various Hand Farm and Garden Tools, explaining the different uses to which the Tools may be put and the varieties furnished, which are adapted to numerous different purposes. There is good reason to expect that the distribution of this book will increase the interest of the public in the quality of the Tools it uses, as well as in having the right Tool for the purpose in mind.

This booklet has been gotten out in connection with the company's new advertising campaign, some details of which have already been mentioned in our columns. It includes liberal advertising in periodicals reaching the consumer and the free distribution of a variety of ad-

vertising supplies to merchants handling the company's lines. Special emphasis is laid on the phrase, "True Temper," which is to be applied to all the company's brands of the best grade. The matter now being distributed includes a large illustrated circular addressed to the trade, referring at length to the campaign now being inaugurated and giving cuts of many advertisements already used or to be used during the year. Many of these with mortise for name and address are offered to the trade. A large poster for window use illustrating the "Delighted Farmer" armed with True Temper Tools is also furnished. Proper emphasis is laid on the importance of good salesmanship, and a separate booklet devoted to selling pointers is furnished for the use of clerks and the selling force generally. Many valuable and interesting suggestions are made in this book under the headings, "Opportunities of Retail Salesmen," "How to Study Salesmanship," "Learning Selling Points," "How to Answer Objections," "Sales That Are Missed," &c.

## AMONG THE HARDWARE TRADE.

The Evers Hardware Company, Denton, Texas, was recently incorporated with a capital of \$25,000, the incorporators being A. F. Evers, R. H. Evers and W. T. Evers. The company will handle a general line of Hardware, Implements and Harness.

The Hardware stock and business of H. R. Christy, Red Oak, Iowa, has been purchased by J. F. Latimer, who is now in possession and conducting the business.

The Rancier Hardware Company, Killeen, Bell County, Texas, has been incorporated with a capital stock of \$15,000, and the following officers have been elected: William Rancier, president; W. M. Ray, secretary, and J. B. Jarnagin, treasurer.

The Moore Hardware Company, Knoxville, Tenn., has been succeeded by the Moore-Carpenter Hardware Company, which has recently been incorporated with a capital stock of \$50,000. The present officers of the firm are as follows: James T. Moore, president; C. L. Carpenter, vice-president; E. V. Jacobs, secretary, and R. G. Wright, treasurer.

The Yantis-Kinthead Hardware Company, Fort Smith, Ark., has filed articles of incorporation, showing a capital stock of \$15,000. The incorporators are A. B. Yantis, D. C. Kinthead, B. W. Yantis and H. Strother.

The Farmers' Hardware Company, Iron River, Bayfield County, Wis., has recently been incorporated with a capital stock of \$10,000, the incorporators being Ernest Sauve, Joseph Doucette and M. F. Doucette.

The business of Craig & Shoffner Hardware Company, Nashville, Tenn., which has heretofore existed as a partnership, has been incorporated with an authorized capital of \$20,000. The officers are: J. F. Craig, president; S. D. Shoffner, vice-president, and J. J. Dannaher, secretary and treasurer. The new concern will increase its stock considerably, and add another man to its traveling force.

The firm of Allen Crawford & Son, Springfield, Mich., has been dissolved, and Allen Crawford, Jr., will continue the business.

EMERY WATERHOUSE COMPANY, Portland, Me., has been forced to secure additional storage facilities to accommodate its expanding business. Space has been leased in a building adjoining the company's main store, affording nearly 10,000 sq. ft. of floor space, which is especially convenient for the use intended.

THE JOSEPH WOODWELL COMPANY, jobber of general Hardware, Rubber Goods, Belting, Factory Supplies &c., has moved into its new eight-story warehouse, corner of Wood street and Second avenue, Pittsburgh, Pa.

## MONTGOMERY WARD & CO.'S APPLICATION DENIED.

**A**N important decision has just been rendered by Judge Carland of the United States Court, Sioux Falls, S. D., in which he denies the application of Montgomery Ward & Co., Chicago, for a temporary injunction restraining the officers and directors of the South Dakota Retail Merchants' Association and E. J. Mannix, editor of the *Commercial News*, published in Sioux Falls, from continuing their alleged boycott against Montgomery Ward & Co. The complete decision of Judge Carland is as follows:

By the bill filed in this action, complainant seeks to perpetually enjoin the defendants from demanding, urging, soliciting or asking any wholesaler, jobber, manufacturer or any one else to sever business dealings or relations with the said complainant, or to cease selling merchandise of any kind to the complainant; from threatening, coercing or intimidating any manufacturer, jobber, wholesaler or any one else concerning business dealings of any kind with the said complainant; from preparing, printing, publishing, mailing, posting, distributing or uttering any threats of injury, or intimidations to any corporation, firm, association or person regarding its or their business relations to the complainant; from preparing, publishing, posting, making or delivering any communication in the interest of or in furtherance of any blacklist or boycott against any manufacturer, jobber, wholesaler or any one else, the effect or purpose of which is to restrain trade, or calculated to prevent and impair free, full and unrestricted competition or trade of all persons with complainant.

By the motion now submitted to the court complainant asks that a temporary injunction be granted, enjoining the defendants from doing acts above mentioned while this suit is pending. Where the only object of a suit in equity is a permanent injunction, a temporary injunction will not issue where the court is of the opinion that there is no probability that the complainant will succeed on the merits. In the consideration of this motion it will be necessary to consider the case against the members of the South Dakota Retail Merchants' Association, hereafter in this opinion called retail dealers, and the case against the defendant Mannix, as publisher of the *Commercial News*, separately as these defendants do not appear from the evidence to be so connected as to make the case of one binding upon the other.

### Statement of the Case.

The case made by the evidence submitted to the court against the retail dealers by complainant, is substantially as follows:

Complainant is and has been for more than 30 years past actively engaged in the business of retailing and dealing in general merchandise, including Hardware, Groceries, Drygoods, Farm Implements, Machinery, Clothing, Furniture, Drugs, Chemicals and many other kinds and varieties of merchandise, with its headquarters and principal place of business in the city of Chicago, in the State of Illinois, and conducts said business throughout the United States, including the State of South Dakota, by means of a certain business method commonly known and described as the "Mail Order" or "Catalogue Method." The complainant originated, instituted, and developed the mail order or catalogue system or method of doing business, the chief element of which consists in dealing directly with the customer or consumer by means of placing in his hands a printed catalogue containing a description of the articles of merchandise offered for sale and the price thereof.

The South Dakota Retail Merchants' Association is a voluntary association organized for the purpose of correcting trade abuses, to develop the mercantile profession and to co-operate with other organizations having like objects. The retail dealers held their annual meeting at Mitchell, January 23, 1906, and soon after said meeting there was with the consent and knowledge of its principal officers, issued and sent to a great number of wholesalers and jobbers throughout the United States who were not members of said association the following circular letter:

SIoux FALLS, S. D., March 1, 1906.  
The South Dakota Retail Merchants in convention assembled at Mitchell, S. D., January 23, 24, 25, 1906, expressed strong sentiments and were unanimous on the subject: Relating to the selling of merchandise by the jobber and manufacturer to the catalogue or mail order houses. That it was unfair treatment on the part of the wholesaler toward the retailer. The retail merchant of South Dakota feels that the cause of the catalogue house has been advanced by the wholesaler, inasmuch as the stock of the mail order house is carried by the wholesaler. The retail merchants have suffered in consequence of this arrangement.

Will you not act with the retail merchants? Do you at

the present time encourage and help the catalogue house business? Will you not refuse to sell to the mail order house, and will you confine your trade to the legitimate retail dealer?

Any suggestion for co-operation for our mutual interests of both the wholesaler and retailer we would as a body of merchants be glad to receive and consider.

This letter is indorsed by the Board of Directors and sent out under their instructions. Yours truly,

L. S. TYLER, Secretary.

That on July 14, 1906, there was issued and sent to the members of said voluntary association a letter in words and figures as follows:

SIoux FALLS, S. D., July 14, 1906.

The attached list comprises those jobbers that refused to answer in any way the letter that was sent out by the Retail Merchants' Association at your request in March asking them if they would act with the retail trade and not with the catalogue houses.

In these houses refusing to answer our letters and ignoring the merchants, through their association, the secretary cannot come to any other conclusion than that they prefer the business of the catalogue houses as against retailers of this State. It would seem that, in the course of business, a jobber that depended on the retail trade for his support might have courtesy enough to reply to a fair question, even though he might not be in accord with it and preferred to trade with the catalogue houses. Hang this over your desk for reference. Yours truly,

L. S. TYLER, Secretary.

The defendant, E. J. Mannix, is the editor and publisher of the *Commercial News*, a monthly magazine published at the city of Sioux Falls, in the interests of the retail merchants of South Dakota and the adjacent States, as well as in the interest of the consumers of said State. That said *Commercial News* has published from time to time the official transactions of the South Dakota Retail Merchants Association, and has at all times advocated, according to its views, the interests of the retail dealers as against complainant and other mail order houses, and it is the intention of the editor of said publication to continue to so advocate said interest as long as he may desire to do so. Said publication, however, has never been the official paper or organ of the South Dakota Retail Merchants' Association in such a sense as would make said association or its members responsible for the utterances of said publisher. The defendant, E. J. Mannix, ceased to be a member of said association January 1, 1907. The *Commercial News* published the letters hereinbefore referred to and signed by L. S. Tyler, secretary, and accompanied said publication with editorial comment, strongly supporting the position taken by said voluntary association. That by reason of the letters sent out as aforesaid, and by reason of the publications contained in said *Commercial News*, some wholesalers and jobbers have declined and continue to decline to furnish to complainant goods or merchandise manufactured by them, so that said complainant is unable to obtain or procure very many articles of merchandise which it has hitherto bought, sold and distributed to its customers, which has resulted in injury and impairment of complainant's business and that complainant's damage as claimed in the bill exceeds, exclusive of interest and costs, the sum of \$2000. It is alleged in the bill that the acts of said voluntary association and its officials, together with the publications contained in the *Commercial News*, have all been committed in pursuance of a conspiracy between the members of said voluntary association and said defendant, E. J. Mannix, to injure and boycott the business of the complainant.

It also fairly appears from the evidence that the retail dealers have agreed among themselves that they will not purchase any merchandise from wholesalers and jobbers who sell to catalogue or mail order houses. It does not appear, however, that said retail dealers intend to do anything in connection with the matters in controversy different than they have done already. It must be remembered that the retail dealers and complainant are competitors in business, and that the retail dealers have committed the acts shown by the evidence for the purpose of

### Protecting Their Own Interests.

so that the retail dealers do not stand in the position that a combination of persons would who had no interest of their own to protect. It is impossible to reconcile all the decisions bearing upon the power and authority of a court of equity to restrain by injunction, combinations of persons having for their object an interference with the business of another. So far as the acts done by the combination are concerned, each case must be judged by its own facts. All of the cases similar to the one at bar have arisen where a combination of persons have sought to interfere with the free flow of trade of another by acting upon the free will of his customers. It is believed that this is the first case where complaint has been made of interference with the free will of the persons from whom one purchases the merchandise which he sells. But the right to do business, free from interference except from lawful competition includes the right to buy as well as to sell, although it is quite probable that the damage from interference in the former case



would be much less than in the latter. An examination and consideration, however, of the numerous cases bearing upon the question at issue has convinced the court that before a court will enjoin the commission of acts by a combination of persons which interfere with the business of another, the court must find that the acts are unlawful. For damage arising from the commission of lawful acts, the law affords no remedy. The facts in evidence on this hearing show that the retail dealers have agreed among themselves that they will not purchase merchandise from wholesalers and jobbers who sell to catalogue or mail order houses. That they have corresponded with jobbers and wholesalers stating that the retail dealers were opposed to said wholesalers and jobbers selling to catalogue or mail order houses, and have requested the former not to sell to the latter. Are these acts of the retail dealers unlawful? Do they show unfair trade competition? Is persuasion unlawful when considered with reference to the facts of this case, or, in other words, is persuasion unfair competition? Upon the answer to these questions depends complainant's right to a temporary injunction.

#### That the Retail Dealers Have a Lawful Right

to agree among themselves that they will not purchase merchandise from wholesalers and jobbers who sell to catalogue or mail order houses, cannot be denied and it necessarily follows that they have the right to inform each other as to what wholesalers and jobbers do sell to catalogue or mail order houses. The question in this case is, what may they do in addition, to influence the wholesalers and jobbers not to sell to catalogue houses.

It must be conceded that complainant has the right to transact and carry on its business free from intimidation or coercion. That this is a property right, and that a combination to interfere with this right otherwise than in fair competition must show justification. The American cases, however, when carefully considered show that the great weight of authority in the United States is in favor of the proposition that it is not unfair competition, intimidation or coercion for a combination to interfere with this right by persuasion or any peaceable means: *National Protective Association vs. Cumming* 170 N. Y. 315; *Fletcher Company vs. Association of Machinists* 55 Atlantic Reporter 1077; *Foster vs. Retail Clerks' Association* 78, N. Y., Supp. 860; *Reynolds vs. Everett* 144, N. Y. 189; *Pomeroy's Equity Jurisprudence*, Vol. 6, Section 595; *Bohn Mfg. Company vs. Hollis* 54 Minn., 223.

#### Nothing Actionable.

It thus appears that the retail dealers have done nothing nor threatened to do anything which is actionable. Whatever the defendant Mannix has done has been as publisher of the *Commercial News*, and not as a member of any combination. As such publisher he is entitled to invoke the constitutional guarantee contained in Section 5 Art. 6 of the Constitution of South Dakota, which so far as pertinent is as follows: "Every person may freely speak, write and publish on all subjects, being responsible for the abuse of that right." In the jurisprudence of the United States there is no remedy for the abuse of this right conferred by the Constitution, except an action at law for damages or a criminal proceeding by indictment or information. *Marlin, F. A., Company vs. Shields* 171 N. Y. 384; *Frances vs. Flinn* 118 U. S. 385; *Kidd vs. Horry* 28 Fed. 773; *Brandreth vs. Lance*, Page 8, 24; *Boston Diatite Company vs. Florence* 114 Mass. 69; *Singer Mfg. Company vs. Domestic Sewing Machine Company* 49 Ga. 70; *Townsend, on Slander and Libel*, Section 417a; *Odger, on Libel and Slander* 13; *Oving vs. Partridge* 83 N. Y. Supplement 249.

It results from what has been said in behalf of the retail dealers that defendant Mannix is not a member of an unlawful combination, and so far as he is concerned as publisher, this court cannot assume the duty of censor and lay down rules for his guidance. He has the right to publish. If he abuses it the complainant has the same remedy as any other citizen, no less and no more. It seems to be conceded that this court may not enjoin the publication of libels but it is insisted that it may enjoin publications which aid any combination having for its purpose an unlawful injury to one's business. There are two reasons why an injunction should not issue to restrain the publications of articles by the defendant Mannix, which though not libelous, have a tendency to injure the business of complainant and they are: First, This court cannot determine in advance by any rule which it might promulgate for the guidance of the defendant Mannix, as to what would be a mere libel and what would come within the prohibition of the injunction. Second, without reflecting in any way upon the character or influence of the *Commercial News*, it may be said that the court cannot find that any article published by it on its own behalf alone would unlawfully intimidate anyone or compel any jobber or wholesaler

to refuse to sell to catalogue or mail order houses against their will.

The motion for a temporary injunction must be denied.

## Nebraska Retail Hardware Convention.

(By Telegraph.)

THE NEBRASKA RETAIL HARDWARE ASSOCIATION opened its sixth annual convention at the Auditorium, Omaha, Tuesday morning, February 5, and the sessions will continue during Wednesday and Thursday, February 6 and 7. The morning opened up bright and clear, with the thermometer below zero, and the attendance was large for the opening day. All the available space on the ground floor was occupied with exhibits of manufacturers and jobbers, and some of the local jobbers were obliged to make their showing at their own warehouses, as they were unable to get a place in the Auditorium. The convention is being held on the stage, with a seating capacity of 500.

The forenoon was devoted to a business meeting of the directors, the enrollment of new members, while the Executive Committee looked after the details of the convention. The convention proper was called to order in the afternoon at 2 o'clock by President Roberts of Omaha, after an invocation by Rev. E. H. Jenks. The Hardwaremen were welcomed by Mayor James C. Dahlman. Max Uhlig of Holdrege, ex-president of the association, responded. This was followed by the annual address of President Roberts, who spoke in part as follows:

#### President Roberts' Address.

I hope very soon to see the consummation of my desire—namely, the federation of all lines of retail business. To illustrate: An admission was made by the head of one of the largest mail order houses in Chicago, in an interview a short time ago, that if all lines made as aggressive a fight as the Hardwaremen the mail order houses might well look to their laurels. Federation in all lines of retail merchandising, while yet in its infancy, is a step in the right direction, and I am glad to say that our State is among the first to take the initiative.

#### POSTAL LEGISLATION

is at present being considered by Congress. Our hope is that Chairman Overstreet and his colleagues of the House Committee will see that the interests of the retailers of the country will not be jeopardized for the sole benefit of the very few. Certain postal reformers are arduously at work along the lines of a so-called post check currency system, and as retailers we must be prepared for any move in this direction. The National Retail Hardware Association, through its officers, is alive to all these issues and is watching zealously the interest of every retail Hardware merchant in the country.

Mr. Roberts recommended that the convention consider the subject of delayed freight deliveries.

#### Report of Secretary Barr.

The report of Secretary J. Frank Barr, Lincoln, gave the membership of the association as 301, of which 281 have paid their dues for 1906. This is a good showing, as the organization had but 198 members at the close of 1905. Since then 120 new members have been added, death and business changes being responsible for the loss of 17 members to the association. Mr. Barr spoke of the Hardware exposition, which he said was a new venture this year and attended with considerable financial risk. The outcome had proven more than satisfactory, as manufacturers and jobbers looked upon Omaha as a good place to exhibit and had taken the entire floor space of the Auditorium. In Mr. Barr's capacity as secretary of the Hardware Mutual Fire Insurance Company he reported he had called on dealers wherever possible, while in his capacity as secretary of the association he had presented to them the advantages of membership, inducing many of them to join.

The discussion of constitution and by-laws was then taken up before adjournment until Wednesday morning.

The Wright & Wilhelm Company and the Lee-Glass-Andresen Hardware Company are giving a smoker tonight to the members of the association and other visitors at the Commercial Club.

## A Victory for Retail Interests.

(FROM OUR SPECIAL CORRESPONDENT.)

WASHINGTON, D. C., February 5, 1907.

THE annual Post Office Appropriation bill has been completed by the House Post Office Committee. The Hardware merchants of the country will be glad to learn that all the projects proposed in the interest of the catalogue houses have been rejected by the committee, and that the measure has come from the House without "riders" of any description.

The bill as reported represents a substantial victory for the organized retailers of the country, whose prompt and energetic action in making their Representatives in Congress familiar with the practical effect of the numerous projects brought forward by the Postal Progress League and their allies in the interest of the mail order houses has proved effectual.

### Parcels Post Not Seriously Considered

In the consideration of the bill, the Henry and Hearst measures providing for the establishment of a domestic parcels post were promptly rejected, and it is significant that at no time while the bill was in process of formulation was serious consideration given to any project for the creation of a parcels post. The only plan of this sort to receive any attention was a suggestion for an experimental parcels post to be instituted between certain large cities, for the purpose of determining the approximate cost of such a service. The objections to this plan, however, were manifold. In the first place, it was strongly opposed on the ground that it would prove an entering wedge for a national parcels post, and in this connection the history of the rural free delivery service was very effectively cited.

The strongest argument against it from an administrative standpoint and as an experiment, however, was the obvious fact that a service established between two or three large cities would present very few, of the conditions to be met with in the creation of a national parcels post, and would furnish no reliable basis for a calculation as to cost. It was emphasized in this connection that if the points selected for an experiment were far apart the Government would do a large business at the expense of the express companies, while if they were near together the express companies would get the business at the expense of the Government. This principle underlies all parcels post schemes and militates against the reliability of any statistics based on experiments conducted under conditions arbitrarily imposed.

### General Madden's Plan.

The "conservative" proposition put forward for several years past by Third Assistant Postmaster-General Madden reducing the postage on merchandise from 16 to 8 cents per pound, and which the postal officials have frequently referred to as a "limited parcels post," has found some favor in Congress among members who look upon compromise legislation as the easiest way out of embarrassing situations due to the conflicting interests of their constituents. The artificial sentiment among the farmers in favor of a cheaper merchandise rate has exercised considerable influence in both houses, especially among Senators and Representatives who have not taken the trouble to ascertain the methods by which this so-called "public opinion" has been worked up by the catalogue houses and their allies. The members of the House committee, however, have gone into this phase of the subject very thoroughly, and as Chairman Overstreet recently stated to the correspondent of *The Iron Age*, the most important result from the establishment of an 8 cent rate on merchandise would be a saving to four or five gigantic mail order houses of nearly one-half their present postage bills.

### The Postal Check Currency Scheme,

so strongly advocated by First Assistant Postmaster-General Hitchcock, has naturally received more consideration at the hands of the Post Office Committee than

any other project, for the reason that it represents the results of a recent investigation by a special departmental commission and is not merely a project that has been perfunctorily presented year after year as in the case of the consolidated postage rate. During the last Congressional recess the department made a study of the Canadian system of transmitting small sums by mail, and, finding that there had been a considerable increase in the total amount thus handled, urgently renewed the recommendation originally presented, a year ago. The committee, however, had before it the detailed report of the hearing given to the promoters of the Post check currency scheme last winter—fully reported in *The Iron Age* at the time—and was therefore advised as to the manner in which interest in this project has been developed. After very little consideration, therefore, it was rejected.

### The Victory of Retail Interests,

with regard to all these projects, has been rendered less difficult at this time by reason of the delay in beginning the work of framing the Post Office bill. At the last short session two years ago the bill was reported to the House before the holiday recess; therefore, it is this year a full month behind and must be rushed through with the briefest possible discussion in both houses. Under these conditions it would have been a mere waste of time to add any new legislation to the bill, as it would have been subject to a point of order, which, if made by a single member or Senator, would result in the striking out of the objectionable provision. The postal "reformers" have frequently asserted that the best opportunity to secure the adoption of these projects would be presented at a short session, in view of the confusion incident to the tremendous congestion of legislation in the closing hours of Congress. The Post Office Committee, however, has discounted this consideration and will take into the House one of the cleanest bills it has ever reported.

### One Feature of the New Bill

will attract much attention throughout the country, namely, the enormous increase, amounting to nearly \$5,000,000, in the cost of the rural free delivery service. The total appropriations for this service for the fiscal year beginning July 1 next, aggregate the stupendous sum of \$32,987,400, as compared with \$28,200,000 appropriated for the current fiscal year. This enormous increase is due, however, not to the proposed expansion of the service during the next fiscal year, but to an increase in the compensation of rural carriers, whose maximum pay will be \$840 per annum instead of \$720 as at present. It is estimated that on July 1 next there will be approximately 38,000 carriers in the service, and provision is made for an increase of about 2000 routes and carriers during the coming fiscal year. This is not an abnormally large increase in the number of new routes to be established, but on the other hand reflects the conservative policy of the present departmental administration, as it represents a smaller rate of increase than has been recorded in any year since the service was established.

### The Growth of the Rural Free Delivery Service,

since it was instituted in 1897 with an experimental appropriation of \$10,000, has been simply phenomenal. In 1906 the expenditure exceeded the cost of the city free delivery service, while the number of carriers employed equaled the combined employees of the city free delivery service and the railway mail service. No citizen can be blind to the importance of the gigantic machine which is being built up in every section of the country, and which, working in a circle, is annually used to force Congress to increase the appropriation by which additional routes are established and more carriers appointed. Although the number of carriers in the rural service now approximately equals the total number of city carriers and railway mail clerks combined, the proportionate influence of the rural service is not correctly represented by these figures. In each large city a few substitute carriers are sufficient to supply the places of all temporary absentees, but under the regulations of the Department a full-fledged substitute is appointed for every rural carrier, so that in 1908 there will be not less than 80,000 rural carriers interested in the further expansion of the service. As each of



these carriers and substitutes is the head or a member of a family averaging five persons, it will be seen that the personnel of the service is a matter of vital interest to no less than 400,000 persons.

There is a consoling reflection, however, which, to some extent, will offset the anxiety of the taxpayer as he examines these tremendous figures. The increase in the salaries of carriers will so swell the appropriations in coming years as to force the strictest economy in the institution of new service. Inasmuch as the rural free delivery service has been of enormous advantage to catalogue houses in reaching new and old customers, this consideration is of great importance. Obviously, too, any policy tending to increase the postal deficit will have a strong influence adverse to all projects for the reduction of the merchandise postage rate, which is now conceded to be barely self-sustaining.

W. L. C.

## DEATH OF JOSHUA STEVENS.

**A**FTER a long and useful life, Joshua Stevens, inventor of the well-known Rifle bearing his name, passed peacefully away on the 21st ult., at the home of his daughter, Mrs. Wilbur F. Davis, Meriden, Conn., with whom he had made his home since 1896. He was 92 years of age. Mr. Stevens had been suffering for the past several weeks with ailments peculiar to advanced age.

Joshua Stevens was born in Chester, Mass., September 10, 1814. He learned his trade as a machinist in Chester, where he commenced as an apprentice in 1834, working from 5 a.m. until 7 p.m. for \$6 per month for the first year, and \$8 and \$10 per month respectively for the two succeeding years. In the spring of 1838 he settled with his employer, taking his note for \$150. Soon after this he took up Pistol and Gun work, which he kept at in some form up to his retirement from business in 1896. He was probably as familiar with the history of the Gun business in this country as any one living. The modern Pistol and Rifle began to be evolved about 1838. Mr. Stevens commenced to work for Cyrus B. Allen in a small shop in Springfield, Mass., in that year, and continued for some years in his employ.

Early in the forties he met the celebrated Col. Samuel Colt, who had in his possession a crude idea of a Revolver, which after some changes he had patented and made by Eli Whitney at Whitneyville, Conn. Colonel Colt thought he could save money by having a shop of his own, and in company with Mr. Stevens rode about the country looking for a place to locate. He finally started a small shop on Pearl street, Hartford, Conn., and there, while in Colonel Colt's employ, Mr. Stevens produced the first model of Colt's Revolver ever made in Hartford.

A few years after that Mr. Stevens invented another Revolver, which he started to make on his own account, when Col. Colt sued him for infringement. The case was tried in the United States Court in Boston, and, although Mr. Stevens had the eminent Rufus Choate for one of his lawyers he lost his case and was obliged to quit that branch of his business.

Soon after the commencement of the Civil War Mr. Stevens started the J. Stevens Arms & Tool Company, at Chicopee Falls, Mass. From a small beginning this company has grown until at the present time it is one of the largest factories engaged in the manufacture of Firearms for sporting purposes in the world. Mr. Stevens was president of this corporation until 1896, when, on account of advancing age and the removal of his daughters to other parts of the country, he decided to retire from business, and made his home in Meriden, Conn.

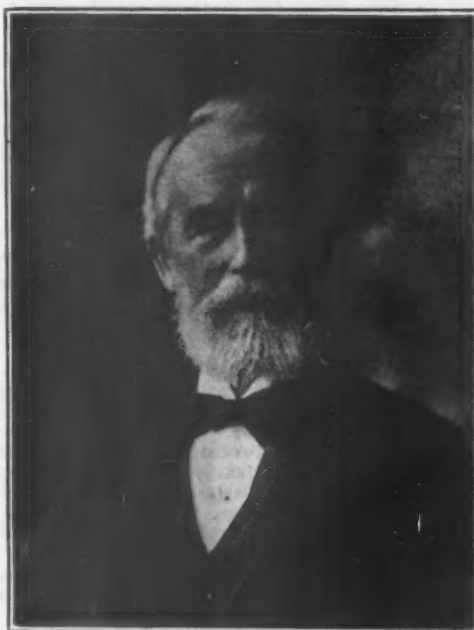
In the year mentioned Irving H. Page bought the interest which Mr. Stevens and his partner, James E. Taylor, had in the business, and C. P. Fay acquired the interest which his father, William Fay, had held in the J. Stevens Arms & Tool Company. This ended Mr. Stevens' active participation in business, and shortly after he removed to the home of his daughter at Meriden, Conn.

Mr. Stevens was very proud of the success of his business and the popularity and great sale of the Rifles and Guns which bear his name, and made frequent trips

to Chicopee Falls to keep in touch with the business and give the present management the benefit of his ripe experience. He had an extensive acquaintance among men in military circles and among manufacturers of Firearms in the past 60 years, many of whom have passed away. He was a friend of John Brown, and the Pistols Brown used in his raid at Harper's Ferry were made by Mr. Stevens and sold by him personally to Brown at Chicopee Falls only a short time before the historic raid.

A few years ago the Stevens Company branched out still further, and began the manufacture of Gasoline Automobiles, known throughout the world as the Stevens-Duryea—the first part of the trade name being in honor of Joshua Stevens.

In his domestic life Mr. Stevens was an ideal character. Gentle and kind of disposition, he made many friends, who will be sorry to learn of his demise. His nature was that of the true old New England gentleman, courteous and affable at all times and under all circum-



JOSHUA STEVENS.

stances, and though naturally retiring, those who were fortunate enough to call him friend are the better for having known him.

Mr. Stevens is survived by three daughters: Adelaide, widow of Judge Wilbur F. Davis; Isabelle, wife of Professor Tolman, Instructor of English Literature in the University of Chicago, and Jane, wife of Amos Crane of the Boston & Albany Railroad.

A SMALL PARTY of manufacturers and jobbers from different parts of the United States, including S. Norvell, president of the Norvell-Shapleigh Hardware Company, St. Louis, Mo., will sail from New Orleans early in February to visit a number of Central American ports. They will spend several days inspecting the Panama Canal and will also visit Hayti, Jamaica, Cuba and Porto Rico. The object of the trip is not merely rest and recreation, but to study the business possibilities of the various places visited.

M. L. COOPER has been appointed general manager of the Livingston Nall Company, whose new offices are located in the Vincent Building at 302-304 Broadway, New York. Mr. Cooper has been identified with the company for a number of years in charge of the sales department.

AUGUST C. PIEPER has been admitted to partnership in the firm of Bruce & Cook, 190 Water street, New York, dating from February 1.

## PHILADELPHIA HARDWARE MERCHANTS AND MANUFACTURERS' BANQUET.

OVER 150 members and guests of the Hardware Merchants and Manufacturers' Association of Philadelphia assembled in the "Clover Room" of the Bellevue-Stratford Hotel in that city on Thursday evening, January 31, to participate in the annual banquet of the association. Previous to the banquet an informal reception was held in the "Red Room" of the hotel. This was largely attended, and many were the congratulations extended on this the twenty-first annual social function of the association.

As its principal guests the association had the Hon. John Weaver, Mayor of Philadelphia, who responded to the toast "Philadelphia;" Webster R. Walkley, D. C. L., of New York, who spoke on a "Hardware Man's Thoughts About Some Other Things;" William Glasgow, Jr., who replied to the toast, "A Virginian in the Quaker City;" Rabbi Joseph Krauskopf, D. D., Philadelphia, and George H. Sargent, who made short addresses on general subjects, while among others who occupied seats at the speakers' and guests' table were Toastmaster John R. Griffiths, Charles Z. Tryon, who made an address on the subject, "A Square Deal;" William W. Supplee, T. James Fernley, Thomas Devlin, Mahlon N. Kline, James R. Ritter, Milton Jackson, Charles M. Biddle, Rev. John R. Davies, D. D., Chas. Stockton Thorne, Hugh McCaffrey, Samuel F. Wilson, Samuel Disston, B. A. Hawley, Chas. B. Adamson, Ellicott Fisher, Louis J. McGrath, Chas. H. Parsons, John K. Edwards, Robert N. Peck, Chas. E. Grange and Thomas Hobson, while at other tables arranged at right angles to the speakers' table were seated many prominent representatives of the Hardware trade as follows:

Ralph H. North.	C. D. Shoemaker.	Edw. B. Mears, Jr.
Wm. A. Graham.	R. J. Hicks.	Crawford Miller.
A. C. Albrecht.	A. S. King.	Robert W. Mallon.
Geo. A. Graham.	N. F. Cressman.	C. M. Ghiskey, Jr.
Robt. Biddle, 2d.	Jno. McCaffrey.	H. S. Hendrickson.
Wm. M. Brownback.	Wm. J. Devlin.	T. B. Hendrickson.
Harry C. Disston.	Geo. Holmes.	G. M. Jacobi.
F. R. Plumb, Jr.	Elmer E. Dyer.	E. Parsons, Jr.
Geo. Koon.	Jas. T. Riley.	G. F. Young.
Ed. Chandlee.	Wm. Stewart.	S. S. Reckefus.
Frank G. Drew.	Frank Soley.	Arthur K. Liveright.
Rev. Crosswell McBee	J. R. M. Adams.	D. Crawford, Jr.
Walter Devlin.	Paul A. Griffith.	H. C. Russell.
James S. Bonbright.	E. J. Griffith.	J. B. Morgan.
A. F. Horton.	W. K. Wilson.	John A. Brainerd.
C. O. Krauss.	Edw. A. Cherry.	Job T. Pugh.
T. J. Fegley.	Chas. A. Huff.	M. B. Dwight, M. D.
Wm. J. Coane.	F. B. Hippenstiel.	O. M. Milligan.
Albert R. Lloyd.	C. H. Baldwin.	S. T. Riegner.
W. Allen Barr.	E. C. Griswold.	Fulton D. Hall.
John Allen.	W. H. Booth.	Geo. S. Spence.
John L. Clayton.	J. L. Richards.	W. L. Coover.
A. A. Rogers.	J. E. Findlesen.	G. S. Carrigan.
F. W. Huff.	Chas. P. Soden.	A. A. Miller.
N. D. Perline.	Frank L. Sherman.	Geo. Baude.
J. H. Van New Kirk.	Jos. J. McCaffrey.	D. W. Jenkins.
Wm. F. M. Braun.	Chas. M. Biddle, Jr.	Henry Marsh.
Thos. A. Fernley.	Edw. Knight.	G. B. Clayton.
Geo. A. Kircher.	H. L. Meerkle.	W. C. Krider.
W. C. Potts.	A. M. Bentley.	Edw. V. McCaffrey.
Geo. E. Saul.	David H. Reddie.	H. E. Lovell.
W. C. Taylor.	W. A. McCaffrey.	E. S. Naylor.
David S. Cann.	W. H. Jones.	Frank West.
Clarence R. Brown.	W. A. Rambo.	J. E. McCausland.
E. E. Brown, M. D.	Thos. Nelson.	Wm. McIntire.
B. B. Conarroe.	C. C. Sharpless.	Geo. F. Barnett.
Louis V. Wolf.	Walter S. Cook.	H. G. Craft.
A. C. Jackson.	W. H. Stubbs.	W. B. Parker.
Wm. Ramsay.	Clarence Illingworth.	R. H. Hutchinson.
Jas. F. Curley.	Chas. B. Parsons.	W. F. Baldwin.
E. S. Jackson.	W. J. Surre.	C. L. Schlater.
C. Carll.	J. D. Brainerd.	D. W. Wolf.

After proceeding to the banquet hall, which was tastefully decorated with the national, State and city colors, President John R. Griffiths welcomed in a few words the members and their friends, and called upon Rabbi Krauskopf, who invoked the blessing.

At the close of the banquet Toastmaster Griffiths introduced as the first speaker of the evening, the Hon. John Weaver, who in responding for the city of Philadelphia, made a very interesting address, in the course of which many plans for commercial as well as civic betterment were touched upon. Webster R. Walkley, D. C. L., in replying

to the toast, "A Hardwareman's Thoughts About Some Other Things," made an address, which had the close attention of every one present. In his eloquent manner he spoke largely of the country's welfare and the part man, and particularly the Hardwareman, had played in its advancement.

### Chas. Z. Tryon's Address.

Charles Z. Tryon was then introduced by the toastmaster, and in reply to the toast, "A Square Deal," spoke in part as follows:

The people of this country are at this time grappling with a subject unique in the history of nations—the proper adjustment and control of immense prosperity. That this prosperity has been largely due to our great natural resources is undoubtedly true. But also the Government has been wise in creating artificial means for the growth and progress of certain industries, so that their energies have been conserved and have effected in time a reimbursement to the community; and in its wisdom the Government should continue to encourage even by subsidies, if necessary, those enterprises which, lacking the support enjoyed by like industries abroad, are thereby unable to compete for the world's business. But when in the course of time, these protected industries have assumed abnormal proportions, the proper adjustment of their relations to the general community be-



PRESIDENT JOHN R. GRIFFITHS.

comes a problem of far greater difficulty of solution than was the problem of their original encouragement, and it is in the adjustment of these present conditions that we should exercise the greatest care that prejudice shall be eliminated from our every action.

We plant a stripling upon our green lawn, and place about it artificial means of support; protect it from the destroying insect and from the fury of the storm, until it has grown to be a great tree, and when it has reached the proportions of a forest king, we prune and spare not its spreading branches, lest they hide the sunlight from the humble blades of grass from which it sprung; but we touch not a single root that gives it life.

### AN INEVITABLE RESULT.

When in this country prosperity came to all classes, it was the inevitable result that certain individuals and institutions should succeed and prosper more readily than their fellows, for all men are not created with equal ability, and so long as such individuals and groups of individuals operated legitimately along the lines of natural progress, even though subject to artificial Government aid, yet no complaint was registered from the general public. But lately, the fear of the danger which might arise from great centralization of capital has impressed itself unmistakably upon the minds of the people, resulting in sober and careful action at Washington, for the proper control of these conditions and also resulting from time to time in evil projects and schemes for the improper readjustment of values and forcing to the front unsafe leaders who have sought by the aid of a sensational press and the tactics of a demagogue to correct real or imagined wrongs, by exciting the prejudices of the people.



## WRONGS MUST BE RIGHTED.

If certain citizens have used the great centralization of capital to further their particular interests to the detriment of the general public by the breaking of laws, these men must be brought under the law. If their gain has been illegal, they must disgorge; if legitimate, they must be protected; and it is for you and for me and for this Association with its wide spread influence throughout this land and amongst its thousands of employees, to combat with all the energy we possess the anarchistic statements of unprincipled demagogues and prejudiced newspapers. A rack and ruin policy never accomplished anything.

## ALARM UNNECESSARY.

Furthermore, alarm is unnecessary. While great injustices and colossal impositions may seem to darken the whole outlook of the sunshine of prosperity, yet this world has a habit of getting straight down to the bottom of things and in time sorting them right side up by natural means, for fictitious things cannot long exist. You may put fictitious values upon any stock or enterprise and perhaps keep them there until a lot of money has changed from one man's stocking to another's man's jeans, but presently the actual comes bobbing up in a most insistent manner and in time things are sifted down to their true values.

Some persons in Nebraska, not long ago, tried to stamp the dollar mark on a fifty cent piece, but the people quickly saw that the label did not make the value and they promptly tossed this project into history, and it speaks well for the sober thought of the American people that they were not led astray by these false prophets who used every means to incite the prejudice of one class against another for the fulfilment of their illogical schemes.

## A DANGEROUS TENDENCY.

So, too, at the present day, backed by the thousands of unthinking and un-Americanized emigrants, who have been pouring into this country during the last decade, other demagogues of even worse type have sought to array the great masses of the people against the financial interests of the country. That there has been wrong, yes, even crime, in some great financial centers, no one will deny, but the great danger to this country at the present time lies in the fact of a growing tendency to characterize all successful men as criminals. No greater calamity could befall this country in these days of its great commercial triumph than the construction by our own people, of a Frankenstein fiend that with no soul and with but one impulse—the murder of capital—should stalk from the Atlantic to the Pacific, wrecking those enterprises which in their fall would bring calamity to every state, to every city, to you and to me.

## IN THE CORRECTION OF THESE WRONGS,

which are now pressing heavily upon us and which we well know we have the power to correct, we should avoid at all times the spirit of "getting back" at any individual or corporation, not for the purpose of relieving a wrongdoer from just retribution—this he must suffer—but because such a policy results in a waste of energy and is a bad business method. Many a man on the point of abandoning a dishonorable course, or an unfair position, has been driven to its defense because he has been attacked by honorable, though overzealous men, in a prejudiced and hysterical manner. The quiet method may not be spectacular, but it is sure. It takes much less time to fall sick than it does to get well. The quack may stimulate the patient into feeling better, but a reaction is sure to follow. True recovery comes only by the slow process of regaining step by step that which was lost.

During the banquet musical selections were rendered by the Bellevue-Stratford Orchestra, while vocal selections were given by Eugene M. Tyrrell, tenor, and Thomas A. Hogan, baritone; Lawrence Sharkey, humorist, also entertained the gathering with a number of interesting stories.

The menu cards, which have long been a feature of the yearly banquets of the association, were in embossed leather covers. On the fly leaf was a half-tone engraving, retouched in water colors, depicting an exhibit of Tools, as well as drawers for the smaller Hardware articles, the usual announcement of the banquet being displayed on the lower half of the leaf.

In addition to profuse floral decorations the banquet tables were further decorated with souvenirs furnished by the following manufacturers:

Henry Diaston & Sons, Incorporated, Saws.  
National Stamping & Enameling Company, Enameled Ware Pitchers.  
Baeder, Adamson & Co., Manicure Sand Paper.

Miller Lock Company, Pad Locks.  
McCaffrey File Company, Manicure Files.  
Russell & Erwin Mfg. Company, Oxidized Thermometers.  
Liveright Brothers, Manicure Files.  
Fayette R. Plumb, Incorporated, Hammers.  
North Brothers Mfg. Company, Yankee Screw Driver.  
American Fork & Hoe Company, Garden Implements.  
Landers, Frary & Clark, Percolators.  
Corbin Screw Corporation, Watch Fob.

Edward S. Jackson, Walter C. Devlin, A. S. King, Joseph J. McCaffrey, Arthur K. Liverlight and T. James Fernley, the committee having the banquet in charge, were the recipients of many congratulations for their efforts in preparing one of the most enjoyable banquets ever given by the association.

## A VETERAN SALESMAN RETIRES.

GENERAL SYLVESTER LITTLE, for nearly thirty-five years representative of the Goodell Company, Antrim, N. H., and well known to and highly esteemed by the wholesale hardware buyers east of the Mississippi River, voluntarily resigned his position with the company January 1, and will retire from active business life. A few days ago General Little was invited into ex-Governor Goodell's office, and in the presence of the Board of Directors was presented with a handsome silver tea service by Mr. Goodell, who referred to it as a simple reminder of the appreciation of the company of the faithful and successful efforts rendered by General Little in promoting the interests of the company for so many years. Mr. Little responded feelingly, thanking the officers of the company for their uniform courtesy during his long term of service and their confidence in his ability, integrity and good judgment which made his success possible.

Mr. Little was born in Antrim, N. H., and after completing his education worked for his father, who operated a tannery and custom shoe shop, until he was 21 years of age. He then devoted some time to the study of vocal music, and later taught "singing school" successfully throughout the southern part of the State for 13 years. Subsequently he sold cutlery for Woods, Dodge & Co., Bennington, N. H., for about three years; and in 1872 commenced his services on the road for Woods Cutlery Company, traveling mostly in the New England States. Mr. Little has often said that at that time he could carry all his samples in his hat. In 1875 the Goodell Company was organized, acquiring the property of the Woods Cutlery Co. and the hardware business of D. H. Goodell & Co., and Mr. Little became head salesman of the new concern. In recent years he has visited only the jobbing trade, among whom he has a host of acquaintances and many warm personal friends.

Although not a politician Mr. Little has always been deeply interested in local affairs and in 1893-4 represented his town in the State Legislature, where he served with credit as chairman of the Insurance Committee. In 1889-1891 he was a member of Governor Goodell's staff, thus acquiring his military title. On March 26, 1860, he married Mary E. Vose of New Portland, Me. They have two children living. He will continue to reside in his native town, where he owns a most attractive home.

THE CAROTHERS, ROGERS & FAWLKER HARDWARE COMPANY, and the Johnson, Coleman & Graham Hardware Company, Selma, Ark., have consolidated, and hereafter will be known under the name of Selma Hardware Company. The company has been incorporated with a capital stock of \$75,000, and officers have been elected as follows: Robert Coleman, president; J. Y. Fawler, vice-president, and R. S. Carothers, secretary and treasurer.

W. J. MERCER, for 25 years sales manager of the Bindley Hardware Company, Pittsburgh, has resigned to accept the position of buyer and sales manager for the Bernard Gloekler Company, 1127-1131 Penn avenue, Pittsburgh, manufacturer of refrigerators and butchers' tools and supplies.

## PRICE-LISTS, CIRCULARS, Etc.

*Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our catalogue department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.*

WALLACE L. HARDY, Joliet, Ill.: Circular price-list of Rotary Paper Knives and Case Trimmers.

ATLAS SHEAR COMPANY, Bridgeport, Conn.: Illustrated catalogue No. 17, referring to Shears and Scissors, accompanied by discount sheet.

MILWAUKEE TACK COMPANY, Milwaukee, Wis.: Illustrated catalogue and price-list of Tacks, &c.

GOODELL-PRATT COMPANY, Greenfield, Mass.: Illustrated catalogue No. 8, a comprehensive book of more than 200 pages, describing and listing the extensive line of Tools made by the company.

CORTLAND FORGING COMPANY, Cortland, N. Y.: Catalogue C referring to Bow Sockets, Shifting Rails, Top Joints, Canopy Top Standards, Arm Rails, &c., for Carriages and Automobiles.

CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio.: Catalogue No. 32, illustrating and listing an extensive line of Drills, Reamers, Sockets, Bits, Taps, Counterbores, Mills, Cutters, Mandrels, Arbors, &c., with code and tables of valuable information.

EVERY STAMPING COMPANY, Cleveland, Ohio.: Booklet of recipes, &c., referring to Never-Break cooking utensils, which will be furnished gratis to merchants with their imprint.

H. W. COOPER, Moline, Ill.: Illustrated catalogue and price-list No. 16, covering an extensive line of Saddlery Hardware, Creasing and Folding Machines, &c.

ROYAL MFG. COMPANY, Lancaster, Pa.: Booklet referring to Alundum Grinding Wheels of, which four styles are made, for different purposes.

## REQUESTS FOR CATALOGUES, Etc.

*The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM CHAS. H. MILLER, Flint, Mich., who in about to re-engage in the Shelf Hardware, Stove, Paint, House Furnishing and Sporting Goods business.

FROM JAMES & HAWKINS, Jamaica, N. Y., who are listing and classifying their catalogues and price-lists and wish to secure the latest editions issued by manufacturers.

ROYAL MFG. COMPANY, Lancaster, Pa., manufacturer of Hand and Foot Power Grinders, announces that it is represented in the New England States by J. D. Wheeler, Keene, N. H., and in the States of Indiana, Illinois, Iowa, Wisconsin and Michigan by J. C. Murfey, Chicago. S. L. Bigelow & Co., San Francisco, represent the company on the Pacific Coast. Foreign agencies are established in Canada, England and France, while the New York Export and Import Company is accredited sales agent for the Orient.

THE PITTSBURGH AUTOMATIC VISE & TOOL COMPANY, Pittsburgh, has recently appointed the Davis-Kelly Company, Louisville, Ky., its Southern agent. This step was necessitated by the rapid growth of the company's business in that section of the country. The Louisville branch will carry a complete line of vises in order to give prompt deliveries.

## MISCELLANEOUS NOTES.

### The Daisy Chain Pump Curb.

Hawkeye Pump Company, Washington, Iowa, has recently placed on the market a galvanized steel pump curb, which is being sold through jobbers, with exclusive sale in adjacent territory. The curb is made of No. 24 gauge, best galvanized steel, consisting of only three pieces, thoroughly locked and seamed together. It has a wrought iron band at the top and a steel angle at the bottom, the latter placed in such a manner as to let the curb extend below the platform. The curb is recommended for use in wells as deep as 40 ft. The curb is made in addition to other Hawkeye products, including pumps, rural free delivery mail boxes, tanks, troughs, floats, &c.

### Improved Brandt Sprayer Nozzles.

The Quimby Mfg. Company, Minneapolis, Minn., is putting on the market two new nozzles for the Brandt sprayer. One of these is a new double nozzle, which is a marked improvement over the first double nozzle put out by the company. The company claims that it is now perfect in every detail, and handles two rows as readily as the single nozzle does one. The other is a nozzle 3 ft. long for spraying fruit trees, &c., and is claimed to do excellent work. The two nozzles make the Brandt sprayer complete in every respect.

### Ideal Improved Armory Loading Press.

Ideal Mfg. Company, New Haven, Conn., announces that it is now ready to supply its improved armory loading press. The producing capacity of this press has been increased over 400 per cent. These improvements consist of arranging and combining tools to work together, so that the empty shell that has been fired, after being cleaned, is resized, the neck of the shell expanded, the primer seated and the shell automatically ejected; all with one handling of the shell and with one up and down action of the gate, while heretofore to perform these operations, the shell had to be handled six times, and the press used at three different times. Although the facilities of the press have been increased over fourfold, the price of the complete outfit has been increased but slightly. These various combinations and attachments have all been made with an eye to their being applied to any of the old armory presses that are now out. This can be done without returning them to the factory. The extra attachments are complete in themselves, and may be attached to the old machines without any filing or fitting. These extras consist of automatic shell ejector, combined shell resizer and neck expanding tools and an automatic primer feed, pipe, &c. One part of this primer outfit consists of a box containing a little device into which the primers are thrown promiscuously, and with a few shakes of the box the primers are deposited in the feed pipe right side up.

### Price Fireproofing Compounds.

The Price Fireproofing Company, Poughkeepsie, N. Y., and 500 Fifth avenue, New York, are manufacturers of the Price Fireproofing Compound for fireproofing all inflammable substances. There are several formulas designated by letters. Compound A is designed for fireproofing lace curtains, nettings, hangings and various soft materials, paper, matting, &c. The preparation is without starch or stiffening, and when dissolved in hot or cold water is clear or transparent, so that it can be used on various fabrics without injuring color or texture. Starch can be added by the user if desired. The preparation is put up in barrels, half barrels and 10 and 25 cent packages. Compound B is for cordage, canvass, burlaps, cotton bagging or baling, hemp, jute, rope, &c. This is put up in barrels and half barrels and 25 and 50 cent packages. Compound C is more particularly for theatrical scenery and stage appurtenances. The preparation will not affect injuriously the fabric or colors, whether painted in water colors or oil. Costumes may



be treated with this compound either with or without starch. Compound D is for fireproofing wood of all kinds. Compound E is for fireproofing oils, turpentines, benzine and other inflammable liquids used in paints. The latter preparation is packed in 10 and 50 lb. packages and in barrels and half barrels. The company also manufactures the Price fireproofing starch for both fireproofing and stiffening draperies, laces and fabrics of various kinds.

### The Gedge Valveless Automatic Stock Fountain.

Gedge Bros., Iron Roofing Company, Anderson, Ind., is offering the automatic stock fountain shown herewith. The manufacturer states that the fountain will not overflow, that it will let down the water as fast, and only as fast as it is used, that it has no valves or



The Gedge Valveless Automatic Stock Fountain.

mechanical devices, and that it requires no adjustment or attention to make it operate. Before filling the fountain a brass cap is placed on the water outlet at the bottom of the fountain, the water being then poured in at the top until the fountain is filled. The brass cap is then removed from the water outlet and placed on the air vent and the fountain is ready for use.

### The Nip-It Strawberry Huller.

The strawberry huller shown in the accompanying cuts is manufactured by Windsor Stephens & Co., Waltham, Mass. The huller is made of thin spring steel,



Fig. 1.—The Nip-It Strawberry Huller.

and in its natural position the jaws are open as in Fig. 1. In use the jaws are pressed together as in Fig. 2. The advantages of using the device instead of the fingers are that it avoids staining the fingers, getting seeds under the

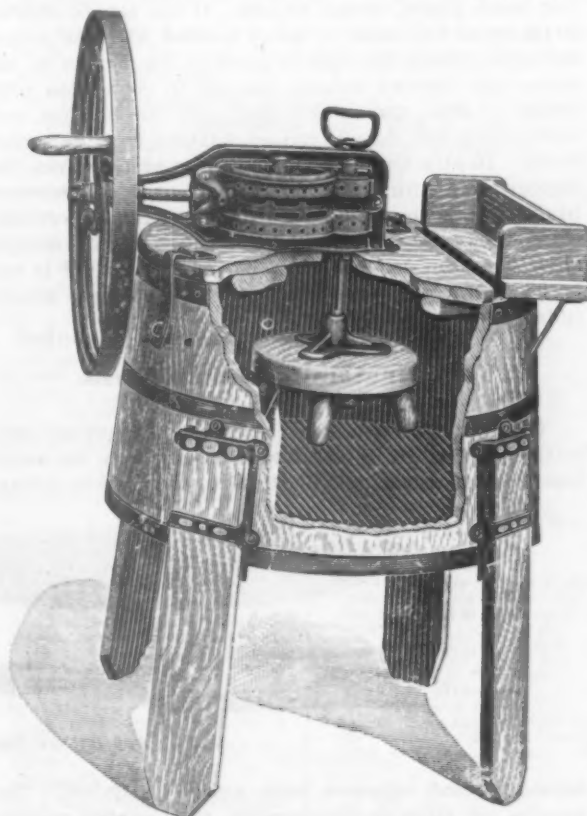


Fig. 2.—Strawberry Huller in Use.

nails and crushing the fruit, besides keeping berries whole for table use and permitting taking out soft spots, &c.

### National Boss Rotary Washing Machine.

Boss Washing Machine Company, Cincinnati, Ohio, is introducing its new washing machine shown herewith. It has shielded gears, large cypress tub, large lid, large dasher and high speed. It is finished in natural wood with stave legs and all iron work is enameled. The washer has one and one-third turn to the dasher. This increased amount of throw to the dasher increases the agitation in the tub, it is explained, thus thoroughly agitat-



National Boss Rotary Washing Machine.

ing its contents. It is pointed out that there is no post projecting below the dasher, and that it is bolted to a slotted shaft, by which it adjusts itself to the contents of the tub. The grip handle on the top of the gear is convenient for throwing open the lid; also when washing the handle permits the operator occasionally to lift the dasher out of the clothes, again distributing the clothes in the tub, allowing free circulation of water through them. Reference is made to the leverage being 6 to 1, thus greatly reducing the labor of operating the machine.

### Sargent's Adjustable Plane Handle.

Sargent & Co., New Haven, Conn., and 149-153 Leonard street, New York, have brought out Sargent's adjust-

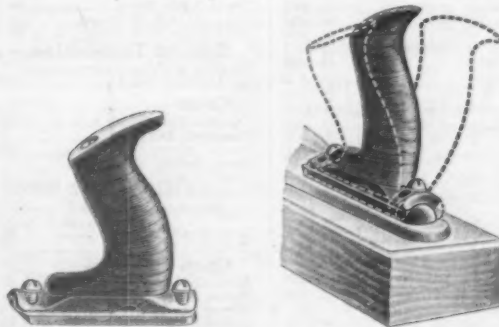


Fig. 1.—Sargent's Adjustable Plane Handle.

Fig. 2.—Showing Some Angles Obtainable.

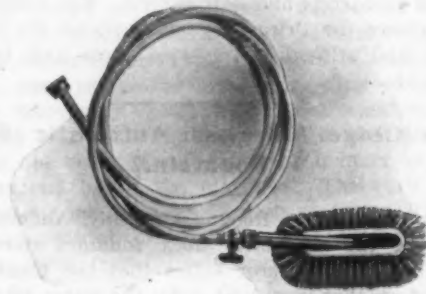
able rosewood plane handle, No. 400, two views of which are herewith given. The purpose of the handle is to enable a workman to quickly and easily adapt a plane to service in otherwise difficult or inaccessible places. Fig.

1 shows the handle with the bottom plate to be screwed permanently to plane body, Fig. 2, indicating by means of the dotted lines some of the angles the handle can be set at right or left. With the handle convertible to any required angle unhandy places like corners of any kind, floors around baseboards, stairs and many bits of cabinet work can be planed advantageously without barking knuckles or injuring the hand. The handle is equally serviceable as a straight handle, and can be fitted to any of Sargent & Co.'s wood bottom planes, and to all of their iron bench planes, except No. 407. It can also be applied to planes of any make by using a screw with the proper thread to attach the bottom plate of the handle to the plane bed. Screws suitable for use in connection with planes of some makers are sent with the handles, and screws with odd threads can be obtained from hardware stores. In attaching the handle to iron bench planes, the bottom plate with circular top is removed and screwed to the body of the plane, when the upper round head machine screws are replaced and tightened after the desired angle has been determined. The same procedure is followed with wood planes, except that the ordinary screws suitable for wood are used.

### The Fountain Cleaning Brush.

The cleaning brush shown in the accompanying illustration is designed to facilitate and make easy the laborious work of scrubbing and cleaning, and may be advantageously used wherever such work is required. The brushes are made in various sizes, with bristles suitable for the service required, and are constructed with a hollow metal back, fitted with attachments for the connection of a hose or long, hollow metal handle. When connected with a hydrant a constant stream of clean water runs through the bristles and washes off the dirt. The

device in its various forms will be found especially serviceable in scrubbing the floors of stores and office buildings, and can also be used with good results in rest-

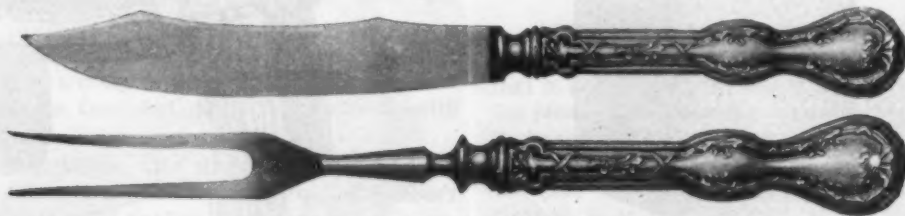


The Fountain Cleaning Brush.

dences. The brush is manufactured and sold by Friedley-Voshardt Company, Incorporated, 194-202 Mather street, Chicago.

### Oak Pattern Carving Knife and Fork.

The E. H. H. Smith Silver Company, Bridgeport, Conn., is putting on the market a new steak or game



Oak Pattern Carving Knife and Fork.

carving knife and fork in artistic oak leaf pattern in high character plate, as shown herewith. The company states that the hollow handles possess great wear resisting qualities and will not work loose. The steel blade is claimed to be of high quality, and is made in 5 and 7 in. lengths. These carvers complete the company's line in the oak pattern.

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## PAINTS, OILS AND COLORS

### Animal, Fish and Vegetable Oils—

Linseed, City, raw.....	41	@42
City, Boiled.....	43	@44
State and Western, raw.....	39	@40
Raw Calcutta, in bbls.....	70	@
Lard, Extra Prime, Winter.....	78	@79
Extra No. 1.....	82	@84
No. 1.....	86	@87
Cotton-seed, Crude, L.O.B. mills.....	34 1/2	@40
Summer Yellow, Prime.....	43 1/2	@44 1/2
Summer White.....	43	@44
Yellow Winter.....	43	@44
Sperm, Crude.....	52	@53
Natural Winter.....	65	@66
Bleached Winter.....	66	@67
Bleached Winter, Extra.....	70	@72
Tallow, Prime.....	58	@61
Whale, Crude.....	33	@36
Natural Winter.....	45	@46
Bleached Winter.....	47	@48
Extra Bleached Winter.....	49	@50
Menhaden, Brown, Strained.....	30	@33
Light Strained.....	30	@33
Northern.....	28	@
Southern.....	27	@
Cocanut, Ceylon.....	9	@10
Cochin.....	9	@10
Cod, Domestic, Prime.....	30	@36
Newfoundland.....	34 1/2	@42
Red, E.A.M.....	46	@48
Saponified.....	46	@47
Olive, Italian, bbls, Yellow.....	67	@75
Neatsfoot, Prime.....	53	@55
Palm, Logos.....	4	@7 1/2

### Mineral Oils—

Black, 20 gravity, 25@30 cold test.....	11	@12
20 gravity, 15 cold test.....	12	@13
Summer.....	11	@12
Cylinder, light filtered.....	16 1/2	@17 1/2
Dark, filtered.....	16 1/2	@17 1/2
Paraffine, 93-97 gravity.....	14	@14 1/2
93 gravity.....	13	@13 1/2
93 gravity.....	10 1/2	@11 1/2
Red.....	13	@14 1/2

### Miscellaneous—

Barytes:		
White, Foreign.....	100	@18.50@20.50
Amer. floated.....	100	@19.00@20.00
Off color.....	100	@13.00@16.50
Chalk, in bulk.....	100	@3.00@3.25
In bbls.....	100	@3.00@3.25
China Clay, Imported.....	100	@11.00@17.50
Cobalt, Oxide.....	100	@2.50@2.80
Whiting, Commercial.....	100	@43@52
Gilders.....	100	@50@65
Ex. Gilders.....	100	@60@
Putty, Commercial—	100	@
In bladders.....	1.70	@1.85
In bbls, or tubs.....	1.30	@1.45
In 1 lb to 5 lb cans.....	2.65	@2.95
In 12 1/2 to 50 lb cans.....	1.50	@1.90
Spirits Turpentine—	gal.	
In Oil bbls.....	7 1/2	@7 1/2
In machine bbls.....	7 1/2	@7 1/2
Glue—		
Cabinet.....	12	@15
Common Bone.....	7	@9
Extra White.....	18	@24
Foot Stock, White.....	12	@14
Foot Stock, Brown.....	9	@11
German Hide.....	12	@18
French.....	10	@10
Low Grade.....	13	@16
Medium White.....	10	@12
Gum Shellac—		
Bleached Commercial.....	47	@48
Bones, Dried.....	67	@68
Button.....	10	@50
Diamond I.....	53	@
Fine Orange.....	62	@65
A. C. Garnet.....	44	@45
Kala Button.....	37	@38
D. C.....	59	@60
Octagon B.....	65	@64
T. N. S. O.....	47	@48
Y. S. O.....	66	@66
Colors in Oil—		
Black, Lampblack.....	12	@14
Blue, Chinese.....	36	@46
Blue, Prussian.....	32	@36

Blue, Ultramarine.....	13	@16
Brown, Vandyke.....	11	@14
Green, Chrome.....	12	@16
Green, Paris.....	24	@24
Sienna, Raw.....	12	@15
Sienna, Burnt.....	12	@15
Umber, Raw.....	11	@14
Umber, Burnt.....	11	@14

### White Lead, Zinc, &c.—

Lead, American White:		
Lots of 500 lb or over, in Oil.....	7 1/2	@
Lots less than 500 lb, in Oil.....	8	@
Lead, English white, in Oil.....	9 1/2	@10
Lead, White, in oil, 25 lb tin		
pails, add to keg price.....	3	@ 1/2
Lead, White, in oil, 12 1/2 lb tin		
pails, add to keg price.....	1	@
Lead, White, in oil, 1 to 5 lb		
ass'ted tins, add to keg price.....	1 1/2	@
Lead, American, Terms: For lots 12		
tons and over 4 1/2 rebate; and 2% for		
cash if paid in 15 days from date of		
invoice; for lots of 500 lbs. and over		
2% for cash if paid in 15 days from		
date of invoice, for lots of less than		
500 lbs. net.....	5 1/2	@ 5 1/2
Zinc, American, dry.....	5 1/2	@ 5 1/2
Zinc, French:		
Antwerp, Red Seal, dry.....	8 1/2	@
Antwerp, Green Seal, dry.....	10 1/2	@
Paris, Red Seal, dry.....	9 1/2	@
Paris, Green Seal, dry.....	11	@
Zinc, V. M. French, in Poppy Oil:		
Green Seal:		
Lots of 1 ton and over.....	13 1/2	@13 1/2
Lots of less than 1 ton.....	13 1/2	@13 1/2
Zinc, V. M. French, in Poppy Oil:		
Red Seal:		
Lots of 1 ton and over.....	11 1/2	@12 1/2
Lots of less than 1 ton.....	12 1/2	@12 1/2
Discounts—French Zinc—Discounts		
to buyers of 10 bbl. lots of one or mixed		
grades, 1 1/2; 25 bbls., 2%; 50 bbls., 4%.		
Dry Colors—		
Black, Carbon.....	4 1/2	@10
Black Drop, American.....	4	@6
Black Drop, English.....	5	@15

Black, Ivory.....	16	@20
Lamp, Con.....	4	@6
Blue, Celestial.....	4	@6
Blue, Chinese.....	30	@33
Blue, Prussian.....	28	@32
Blue, Ultramarine.....	4 1/2	@15
Brown, Spanish.....	4 1/2	@1
Carmine, No. 40.....	3.10	@3.25
Green, Chrome, ordinary.....	3 1/2	@7
Green, Chrome, pure.....	17	@25
Lead, Red, bbls, 1/4 bbls, kegs.....	6	@7 1/2
Litharge, bbls, 1/4 bbls, kegs.....	6	@7 1/2
Ocher, American.....	10	@16.00
American Golden.....	2 1/2	@3 1/2
French.....	1 1/2	@2
Foreign Golden.....	3	@4
Orange Mineral, English.....	10	@12
French.....	10 1/2	@12
German.....	8 1/2	@10
American.....	8 1/2	@9 1/2
Red, Indian, English.....	4 1/2	@6
American.....	3	@3 1/2
Red, Turkey, English.....	4	@10
Red, Tuscan, English.....	7	@10
Red, Venetian, Amer.....	100	@1.50@1.75
English.....	100	@1.15@1.75
Sienna, Italian, Burnt and		
Powdered.....	3	@9 1/2
Italian, Raw, Powdered.....	3	@7
American, Raw.....	1 1/2	@2
American Burnt and Pow'd.....	1 1/2	@2
Talc, French.....	17	@25.00
American.....	17	@25.00
Terra Alba, French.....	107	@1.00
English.....	107	@1.00
American.....	100	@1.00
American.....	100	@1.00
Umber, Tiber, H. & Pow.....	2 1/2	@3 1/2
Turkey, Raw and Powdered.....	2 1/2	@3 1/2
Burnt, American.....	1 1/2	@2
Raw, American.....	1 1/2	@2
Yellow, Chrome.....	13	@15
Vermilion, American Lead.....	13	@25
Quicksilver, bulk.....	5	@
Quicksilver, bags.....	5	@6
English, Imported.....	5	@70
Chinese.....	5	@90@1.00



# Current Hardware Prices.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33½ @ 33½ & 10% signifies

that the price of the goods in question ranges from 33½ per cent. discount to 33½ and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters, Blind--

Domestic, ½ doz. \$3.00.....33½%  
North's .....33½%  
Zimmerman's .....33½%

## Window Stop--

Ives' Patent.....33½%  
Taplin's Perfection.....33½%

## Ammunition-- See Caps, Cartridges, Shells, &c.

## Anti-Rattlers--

Fernald Mfg. Co. Burton Anti-Rattlers, ½ doz. pairs, Nos. 1, \$0.75; 2, \$0.60; 4, \$1.00; 5, \$0.50.  
Fernald Quick Shifter, ½ doz. pairs.....\$2.00@3.00

## Anvils--American--

Eagle Anvils.....1b @ 8½¢  
Hay-Budden, Wrought.....9¢@9½¢  
Trenton .....1b 9½¢@9½¢

## Imported--

Peter Wright & Sons, 1b, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

## Anvil, Vise and Drill--

Millers Falls Co., \$18.00.....15¢@10%

## Apple Parers-- See Parers, Apple, &c.

## Aprons, Blacksmiths--

Livingston Nail Co.....33½%

## Augers and Bits--

Com. Double Spur.....70%  
Jennings' 1/2 in., reg. finish.....60¢@60¢@10%

## Black Lip or Blued--

Boring Mach. Augers.....70%  
Car Bits, 12-in. twist.....60¢@10%

## Lord's Auger and Car Bits--

Lord's Auger and Car Bits.....40¢@5%  
Ft. Washington Auger Co., Concord.....35%  
Forstner Pat. Auger Bits.....25%  
C. E. Jennings & Co.....25%

## No. 10 ext. lip, R. Jennings' list, 25%

No. 30, R. Jennings' list.....40¢@10%

## Russell Jennings' Bits.....

L'Hommedieu Car Bits.....15%  
Mayhew's Countersink Bits.....45%  
Pugh's Black.....25%  
Pugh's Jennings' Pattern.....25%  
Snell's Auger Bits.....25%  
Snell's Bell Hangers' Bits.....60%  
Snell's Car Bits, 12-in. twist.....60%  
Snell's King Auger Bits.....50%  
Wright's Jennings' Bits.....50%

## Bit Stock Drills--

See Drills, Twist.

## Expansive Bits--

Clark's small, 1/8; large, 3/8.....50¢@10%  
Clark's Pattern, No. 1, ½ doz. \$25;  
No. 2, 1/8.....60¢@10%  
C. E. Jennings & Co., Steer's Pat. 25%  
Larigue Pat., small size, 1/8; large size, 3/8.....60¢@10%  
Swan's .....60%

## Gimlet Bits--

Common Dble. Cut.....\$3.00@3.25  
German Pattern, Nos. 1 to 10,  
\$4.75; 11 to 13, \$5.75

## Hollow Augers--

Bonney Pat., per doz. \$5.50@6.00  
Ames .....25¢@10%  
Universal .....20%  
Wood's Universal.....25%

## Ship Augers and Bits--

Ship Augers.....40¢@10%  
Ford's .....33½¢@5%  
C. E. Jennings & Co.....15%  
L'Hommedieu .....33½¢@7%  
Snell's .....40%

## Awl Hfts-- See Handies, Mechanics' Tool.

## Awls--

Brad Awls:  
Handled.....gro. \$2.75@3.00  
Unhanded, Shlided.....gro. \$3.00@3.50  
Unhanded, Patent.....gro. \$3.00@3.50

## Peg Awls--

Unhanded, Patent.....gro. \$1@1.50  
Unhanded, Shlided.....gro. \$3.00@3.50

## Scratch Awls--

Handled, Com.....gro. \$3.50@4.00  
Handled, Socket.....gro. \$11.50@12.00

## Awl and Tool Sets-- See Sets, Awl and Tool.

## Axes--

Single Bit, base weights: Per doz.  
First Quality.....\$4.75@5.00  
Second Quality.....\$1.25@1.50

## Double Bit, base weights:

First Quality.....\$7.00@7.50  
Second Quality.....\$6.50@6.75

## Axle Grease--

See Grease, Axle

## Axles-- Iron or Steel

Concord, Loose Collar.....4½¢@5¢  
Concord, Solid Collar.....4½¢@5¢  
No. 1 Common, Loose.....3½¢@4¢  
No. 1½ Com., New Styles.....4½¢@5¢  
No. 2 Solid Collar.....3½¢@4½¢  
Half Patent.....

Nos. 7, 8, 11 and 12.....70¢@75%  
Nos. 13 to 14.....70¢@75%  
Nos. 15 to 18.....75¢@75¢  
Nos. 19 to 22.....75¢@75¢

## Boxes, Axle--

Common and Concord, not turned lb. 4½¢@5¢

Common and Concord, turned lb. 5½¢@6¢

Half Patent.....lb. 9½¢@10¢

## Bait-- Fishing--

Heudryx.....30%  
B Bait.....25%  
Competitor Bait.....20¢@5%

## Balances-- Sash--

Caldwell new list.....50%  
Pullman .....50¢@60%

## Spring--

Spring Balances.....50¢@10¢@60%

Chattillon's:  
Light Sng. Balances.....50¢@10¢@10%  
Straight Balances.....10¢@40¢@10%  
Circular Balances.....50¢@10%  
Large Dial.....30%

## Barb Wire-- See Wire, Barb.

## Bars-- Crow--

Steel Crowbars, 10 to 40 lb.....per lb. 3¢@3½¢

## Towel

No. 10 Ideal, Nickel Plate.....gro. \$3.50

## Beams, Scale--

Scale Beams.....40%  
Chattillon's No. 1.....30%  
Chattillon's No. 2.....40%

## Beaters, Carpet--

Holt-Lyon Co.:  
No. 12 Wire Coppered ½ doz. \$0.80;  
Tinned.....\$0.85  
No. 11 Wire Coppered ½ doz. \$1.15;  
Tinned.....\$1.20  
No. 10 Wire Tinned.....½ doz. \$1.50  
Western W. G. Co.:  
No. 1 Electric.....gro. \$7.80  
No. 2 Buffalo.....gro. \$9.00  
No. 3 Perfection Dust.....gro. \$8.00

## Egg--

Holt-Lyon Co.:  
Holt, per doz. No. 5, Jap'd, \$0.80;  
No. A, Jap'd, \$1.15; No. B, Jap'd, \$1.85;  
No. 6, Jap'd, \$1.65.  
Lyon, Jap'd, per doz. No. 2, \$1.35.

## Taplin Mfg. Co.: Improved Dover, per gro. No. 60, \$8.00; No. 75, \$6.50; No. 100, \$7.00; No. 102, Tin'd, \$8.50; No. 150, Hotel, \$15.00; No. 152, Hotel Tin'd, \$17.00; No. 200, Tumbler, \$8.50; No. 202, Tumbler Tin'd, \$9.50; No. 300, Mammoth, per doz., \$25.00.

## Turner & Seymour Mfg. Co.: T. & S. Dover.....\$6.00 Western W. G. Co., ½ gro., Buffalo, No. 2, \$9.00; Perfection, No. 3, \$9.00.

## Wonder (R M. Co.) ½ gro. net, \$8.25

## Bellows--

Blacksmith, Standard List.....45%  
Split Leather.....65%  
Grain Leather.....60%

## Hand--

Inch.....6 7 8 9 10  
Doz.....\$5.50 6.15 6.60 7.15 7.70

## Molders--

Inch.....9 10 11 12 14  
Doz.....\$8.00 9.00 10.50 12.50 14.50

## Bells-- Cow--

Ordinary Goods.....75¢@75¢@10¢@5%  
High grade.....70¢@10¢@75%  
Jersey.....75¢@10%  
Texas Stat.....50%

## Door--

Abbe's Gong.....45%  
Barton Gong.....50%  
Home R. & E. Mfg. Co.'s.....55¢@10%  
Trip Gong.....50¢@10¢@10¢@5%  
Yankee Gong.....55%

## Hand--

Polished, Brass.....40¢@60¢@5%  
White Metal.....50¢@10¢@50¢@10¢@5%  
Nickel Plated.....50¢@50¢@10%

## Saws--

Cone's Globe Hand Saws.....33½¢@33%  
Silver Chrome.....33½¢@30%

## Miscellaneous--

Farm Bells.....lb. 2½¢@2½¢  
Church and School.....60%  
Table Call Bells.....50¢@50¢@50%

## Belting-- Leather--

Extra Heavy, Short Lap.....60¢@5%  
Regular Short Lap.....60¢@10¢@5%  
Standard.....70%  
Light Standard.....70¢@5%  
Cut Leather Lacing.....45%  
Leather Lacing Sides, per sq. ft. 25¢

## Rubber--

Agricultural (Low Grade).....75¢@75¢@5%  
Common Standard.....70¢@70¢@10%  
Standard.....60¢@50¢@10%  
Extra.....60¢@60¢@5%  
High Grade.....80¢@50¢@10%

## Bench Stops--

See Stops, Bench

## Benders and Upsetters, Tire--

Detroit Perfected Tire Bender.....40%  
Detroit Stoddard's Lightning Tire  
Upsetters, No. 1, \$4.25; No. 2, \$7.25;  
No. 3, \$10.50; No. 4, \$16.25; No. 5,  
\$20.50.  
Green River Tire Benders and Up-  
setters.....30%

## Bicycle Goods--

John S. Long's Son & Co.'s 1907 list:  
Chain, Parts, Spokes.....50%  
Tubes.....60%

## Bits--

Auger, Gimlet, Bit Stock Drills,  
&c.--See Augers and Bits.

## Blocks-- Tackle--

Common Wooden.....75%  
Hartz St. Tackle Blocks.....50¢@50¢@5%  
B. & L. B. Co.:  
Boston Wood Snatch, 50%; Eclipse  
Steel, 75%; Hollow Steel, 50¢@10%  
Star Wire Rope, 50%; Tarbox Metal  
Snatch, 50%; Tarbox New Style  
Steel, 50¢@10%; Wire Rope Snatch,  
50%.  
Lane's Patent Automatic Lock and  
Junior.....30%  
Stowell's Novelty, Mal. Iron.....50%  
Stowell's Lading.....50¢@10%  
See also Machines, Hoisting.

## Boards, Stove--

Zinc, Crystal, &c.....40%  
Paper Embossed.....40¢@10%

## Boards, Wash--

See Washboards.

## Bobs, Plumb--

Keuffel & Esser Co.....80¢@45%

## Carriage, Machine, &c.--

Common Carriage (cut thread):  
½ x 6 and smaller.....70¢@12½¢@  
Larger and Longer.....80¢@2½¢@  
Phila. Eagle \$3.00 list May 21, '99

## Bolt Ends.....

Machine, ½ x 4 and smaller.....70¢@12½¢@  
Machine, larger and longer.....60¢@7½¢@

## Door and Shutter--

Cast Iron Barrel, Japanned,  
Round Brass Knch:  
Inch.....3 4 5 6 8  
Per doz.....\$1.30 35 45 60 80

## Cast Iron Spring Foot, Jap'd:

Inch.....6 8 10  
Per doz.....\$1.20 1.50 2.25

## Cast Iron Chain, Flat, Japanned:

Inch.....6 8 10  
Per doz.....\$1.00 1.40 1.65

## Cast Iron Flat Shutter, Jap'd,

Brass Knobs:  
Inch.....6 8 10  
Per doz.....\$0.75 95 1.25

## Wrought Barrel Jap'd.....

Barrel Bronzed.....60¢@10%  
Spring.....70¢@10¢@70¢@10¢@5%  
Shutter.....50¢@50¢@10¢@5%  
Square Neck.....75¢@75¢@10%  
Square.....70¢@10¢@10%  
Ives Patent Door.....50%

## Plow and Stove--

Plow.....65¢@10¢@  
Stove.....85¢@50¢@10%

## Common Iron.....

Norway Iron.....80%  
American Saws Company.....60%  
Norway Phila., list Oct. 16, '84.....80%  
Eagle Phila., list Oct. 16, '84.....82½%  
Hay State, list Dec. 28, '99.....90%  
Franklin Moore Co.:  
Norway Phila., list Oct. 16, '84.....80%  
Eagle Phila., list Oct. 16, '84.....82½%  
Eclipse, list Dec. 28, '99.....80%  
Mount Carmel Bolt Co.:  
Norway Phila., list Oct. 16, '84.....80%  
Eagle Phila., list Oct. 16, '84.....82½%  
Mount Carmel, list Dec. 28, '99.....80%  
Russell, Burdall & Ward Bolt &  
Nut Co.:  
Empire, list Dec. 28, '99.....80%  
Norway Phila., list Oct. 16, '84.....80%  
Unson Nut Co.:  
Tire Bolts.....72½%

## Borers, Tap--

Borers Tap, Ring, with Handle:  
Inch.....1¼ 1½ 1¾ 2  
Per doz.....\$1.80 5.60 6.40 8.00  
Inch.....2¼ 2½ 2¾ 3  
Per doz.....\$2.65 11.50

Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.50 each.....25%

## Boxes, Mitre--

C. E. Jennings & Co.....30%  
Langdon, New Langdon and Lang-  
don Improved, 2½@10%; Langdon  
Acme.....15¢@10%  
Perfection.....40%  
Seavey.....40%  
Stanley B. & L. Co., Nos. 250 to  
400, 30%; Nos. 50 and 60.....35%

## Braces--

Common Ball American, \$1.25@1.30  
Barber's.....50¢@10¢@10%  
Fray's Genuine Spofford's.....60%  
Fray's No. 70 to 120, 81 to 123, 207 to  
411.....60%  
C. E. Jennings & Co.....50¢@5%  
Mayhew's Ratchet.....60%  
Mayhew's Quick Action Hay Pat. 50%  
Millers Falls Drill Braces.....25¢@10%  
P. S. & W. Co., Peck's Pat. 60¢@60¢@5%  
Stanley R. & L. Co.:  
Stanley, 35%; Victor.....45%

## Brackets--

Wrought Steel.....80¢@80¢@5%  
Griffin's Pressed Steel.....75¢@10¢@5%  
Griffin's Folding Brackets.....70¢@10%  
Stowell's Cast Shelf, 75%; Sink.....50%  
Western W. G. Co., Wire.....60¢@10%

## Bright Wire Goods--

See Wire and Wire Goods.

## Broilers--

Kilbourne Mfg. Co.....75¢@20%  
Western W. G. Co.....80%  
Wire Goods Co.....75¢@75¢@10%

## Buckets, Galvanized--

Mfg's list, prices per gross.  
Quart.....10 12 14  
Water, Reg.....25.35 28.00 32.00  
Water, Rev.....45.35 48.00 52.00  
Fire, Rd. Btm. 32.00 \$1.65 38.65  
Well.....37.35 \$1.35 45.35

## Bucks, Saw--

Hoosier.....½ gro. \$36.00

## Bull Rings-- See Rings, Bull

## Butts-- Brass--

Wrought, High List, Oct. 26, '06.....30%  
Cast Brass, Tiebout's.....40%

## Cast Iron--

Fast Joint, Broad.....40¢@10¢@50%  
Fast Joint, Narrow.....40¢@10¢@50%  
Loose Joint.....70¢@10¢@75%  
Loose Pin.....70¢@10¢@75%  
Mayer's Hinges.....70¢@70¢@5%  
Parliament Butts.....70¢@70¢@5%

## Wrought Steel--

Reversible and Broad.....75%  
Light Reversible, Light  
Narrow.....75%  
Loose Joint, Narrow, 1½"  
Inside Blind, etc. 70¢@10%  
Back Flaps, Table.....70%  
Chest.....70%

## Cages, Bird--

Hendryx Brass: Series 3000, 5000,  
1100, 10%; 1200, 25%; 200, 300, 600,  
900.....40%  
Hendryx Bronze: Series 700, 800, 10%  
Hendryx Enameled.....40%

**Calipers—See Compasses.****Calks, Toe and Heel—**

Blunt, 1 prong... per lb. 1.44¢  
 Sharp, 1 prong... per lb. 1.44¢  
 Burke's Blunt, 4¢; Sharp, 4¢  
 Gautier, Blunt, 4¢; Sharp, 4¢  
 Perkins, Blunt, 4¢; Sharp, 4¢

**Can Openers—**

See Openers, Can.

**Cans, Milk—**

Illinois Pattern... 5 10 gal.  
 New York Pattern... 1.50 2.20 2.45 each.  
 Baltimore Pattern... 1.50 2.20 2.45 each.  
 Dubuque... 1.35 1.60 1.75 each.

**Cans, Oil—**

Buffalo Family Oil Cans:  
 3 10 gal.  
 18.00 60.00 129.00 gro., net.

**Caps, Percussion—**

Kiey's E. B. 50¢  
 G. D. 50¢  
 F. L. 50¢  
 G. E. 50¢  
 Musket 50¢

**Primers—**

Berdan Primers, 2¢ per M. 2045¢  
 Primer Shells and Bullets, 15¢  
 All other primers per M. 1.50¢

**Cartridges—**

Blank Cartridges:  
 32 C. F., 15.50... 1045¢  
 32 C. F., 17.00... 1045¢  
 22 cal. Rim, 15.50... 1045¢  
 32 cal. Rim, 22.75... 1045¢  
 B. B. Caps, Con. Ball, Swgd. 15.50  
 B. B. Caps, Round Ball... 11.40  
 Central Fire... 25¢  
 Target and Sporting Rifle... 1545¢  
 Primed Shells and Bullets, 15¢  
 Rim Fire, Sporting... 50¢  
 Rim Fire, Military... 1545¢

**Castors—**

Bed 70¢  
 Plate 70¢  
 Philadelphia 70¢  
 Acme, Ball Bearing... 334¢  
 Boss 10410¢  
 Boss Anti-Friction... 70410¢  
 Gem (Roller Bearing)... 40¢  
 Martin's Patent (Phoenix)... 40¢  
 Standard Ball Bearing... 40¢  
 Tucker's Patent low list... 50¢  
 Yale (Double Wheel) low list... 50¢

**Cattle Leaders—**

See Leaders, Cattle.

**Chain, Coil—**

American Coil, Straight Link:  
 5-16 5-16 7-16 1 1/2 1 1/2  
 9-16 6-30 5-25 4-35 4-15 4-10  
 3/4 3/4 1 1/2 1 1/2 1 1/2 1 1/2  
 4-10 3-10 3-8 3-8  
 German Coil... 6041041070%

**Halter—**

Halter Chains... 60¢  
 German Pattern Halter Chains,  
 list July 21, '97... 6041045¢  
 Covert Mfg. Co. 345¢

**Cow Ties—**

See Halters and Ties.

**Trace, Wagon, &c.—**

Traces, Western Standard: 100 pr.  
 6-4 6-3, Straight, with ring, 327.00  
 6-4 6-2, Straight, with ring, 328.00  
 6-4 6-2, Straight, with ring, 328.00  
 6-4 10-2, Straight, with ring, 327.00

NOTE—Add 20¢ per pair for Hooks.  
 Twist Traces: add per pair for Nos. 2  
 and 3, 20¢; No. 1, 30¢; No. 0, 40¢ to price of  
 Straight Link.

Eastern Standard Traces, Wag-  
 on Chain, &c. 6045¢

**Miscellaneous—**

Jack Chain, list July 10, '93:  
 Iron 60410%  
 Brass 60410%  
 Safety and Plumbers' Chain,  
 60410%  
 Gal. Pump Chain... 1041045¢  
 Covert Mfg. Co.:  
 Breast, Halter, Heel, Rein, Stal-  
 lion 40%  
 Oneida Community:  
 American Halter, Dog and Kennel  
 Chains 3542440%  
 Niagara Dog Leads and Kennel  
 Chains 454045%  
 Wire Goods Co.:  
 Dog Chain... 70410%  
 Universal Dbl. Jointed Chain... 50%

**Chain and Ribbon, Sash—**

Oneida Community:  
 Copper Chain, 6045%; Steel Chain,  
 60%

Pullman:  
 Bronze Chain, 60%; Steel Chain,  
 60410%  
 Sash Chain Attachments, per set, 8¢  
 Aluminum Sash Ribbon, per 100  
 ft. 1.25433.00  
 Sash Ribbon Attachments, per set, 8¢

**Chalk—(From Jobbers.)**

Carpenters' Blue... 50¢  
 Carpenters' Red... 45¢  
 Carpenters' White... 40¢

**Checks, Door—**

Hardley's... 45¢  
 Pullman, per gro. 254.00  
 Russell... 334%

**Chests, Tool—**

American Tool Chest Co.:  
 Boys' Chests, with Tools... 50%  
 Youths' Chests, with Tools... 40%  
 Gentlemen's Chests, with Tools... 30%  
 Farmers', Carpenters', etc., Chests,  
 with Tools... 20%

**Machinists' and Pipe Fitters'**

Chests, Empty... 50%  
 Tool Cabinets... 50%  
 C. E. Jennings & Co.'s Machinists'  
 Tool Chests... 33410%

**Chisels—****Socket Framing and Firmer**

Standard List... 75¢  
 Buck Bros... 30%  
 Charles Buck Edge Tool Co... 30%  
 C. E. Jennings & Co.:  
 Socket Firmer No. 10... 60%  
 Socket Framing No. 15... 75%  
 Swan's... 3045%  
 L. & I. J. White Co... 3045%

**Tanged—**

Tanged Firmers... 40%  
 Huck Bros... 30%  
 Charles Buck Edge Tool Co... 30%  
 C. E. Jennings & Co. Nos. 191, 181, 25%  
 L. & I. J. White Co... 2545%

**Cold—**

Cold Chisels, good quality, 15¢  
 Cold Chisels, fair quality, 11¢  
 Cold Chisels, ordinary... 9¢

**Chucks—**

Almond Drill Chucks... 35%  
 Almond Turret Six-Tool Chuck... 40%  
 Beach Pat., each \$5.00... 3545%  
 Empire... 25%  
 Blacksmiths'... 25%  
 Jacobs' Drill Chucks... 25%  
 Pratt's Positive Drive... 25%  
 Skinner Patent Chucks... 25%  
 Independent Lathe Chucks... 40%  
 Universal, Reversible Jaws... 40%  
 Combination, Reversible Jaws... 40%  
 Drill Chucks, New Model, 25%  
 Standard, 40410%; Skinner Pat.,  
 25%; Positive Drive... 25%  
 Planer Chucks... 40%  
 Face Plate Jaws... 40%  
 Standard Tool Co.:  
 Improved Drill Chuck... 45%  
 Union Mfg. Co.:  
 Combination, Nos. 1, 2, 3, 4, 5, 6,  
 7, 8 and 17, 40%; No. 21... 35%  
 Scroll Combination, Nos. 22 and  
 34... 30%  
 Geared Scroll, Nos. 33, 34 and 35... 30%  
 Independent Iron, Nos. 18 and 318... 35%  
 Independent Steel, No. 64... 25%  
 Union Drill, Nos. 600, 60, 100, 101,  
 102, 103, 104... 35%  
 Universal 11, 12, 16, 17, 13, 14, 15... 35%  
 Universal, No. 42... 30%  
 Iron Face Plate Jaws, Nos. 28, 30,  
 46 and 50... 35%  
 Steel Face Plate Jaws, Nos. 70 and  
 72... 30%  
 Westcott Patent Chucks:  
 Lathe Chucks... 30%  
 Little Giant Auxiliary Drill... 50%  
 Little Giant Double Grip Drill... 50%  
 Little Giant Drill, Improved... 50%  
 Oneida Drill... 50%  
 Scroll Combination Lathe... 50%

**Clamps—**

Adjustable Hammers... 2042045%  
 Carriage Makers, P., S. & W.  
 Co... 4041045%  
 Bealy, Parallel... 33410%  
 Lineman's, Utica Drop Forge & Tool  
 Co... 40410%  
 Wood Workers' Hammer... 40410%  
 Saw Clamps, see Vices, Saw Filers.

**Cleaners, Drain—**

Iwan's Champion, Adjustable... 45%  
 Iwan's Champion, Stationary... 45%

**Sidewalk—**

Star Socket, All Steel... 40¢  
 Star Shank, All Steel... 53.24 net  
 W. & C. Shank, All Steel... 40¢  
 1/2 in. \$3.00; 3/4 in. \$3.25

**Cleavers, Butchers—**

Foster Bros... 30%  
 Fayette R. Plumb... 30%  
 L. & I. J. White Co... 30%

**Clippers, Horse and****Sheep—**

Chicago Flexible Shaft Company:  
 1892 Chicago Horse, each \$10.75  
 20th Century Horse, each \$5.50  
 Lightning Belt Horse, each \$15.50  
 Chicago Belt Horse, each \$30.50  
 Stewart's Enclosed Gear  
 Horse, each... 14.75  
 Stewart's Patent Sheep Shear-  
 ing Machine, each... 12.75  
 Stewart Enclosed Gear Shear-  
 ing Machine, No. 8, each... 19.75

**Clips, Axle—**

Regular Styles, list July 1, '05, 80%

**Cloth and Netting, Wire**

—See Wire, &c.

**Cocks, Brass—**

Hardicare list:  
 Plain Bibbs, Globe, Kerosene,  
 Racking, Liquor, Bottling,  
 &c. 6041045%  
 Compression Bibbs... 5041040%

**Coffee Mills—**

See Mills, Coffee.

**Collars, Dog—**

Nickel Chain, Walter B. Stevens &  
 Son's list... 40%  
 Leather, Walter B. Stevens & Son's  
 list... 40%

**Combs, Curry—**

Metal Stamping Co... 40%

**Compasses, Dividers, &c.**

Ordinary Goods... 70410475%  
 Wm. Schollhorn Co.:  
 Excelsior Dividers... 55%  
 Lock Dividers... 75%

**Conductor Pipe—**

L. C. L. to Dealers:

Galv. Charcoal Copper.  
 Steel Iron. 14, 16, 20 oz.  
 Eastern:  
 70% 504174% 30%

**Central:**

65410% 55424% 20410%  
 Western and Southern:  
 6545% 50474% 20474%

**So. Western**

5042542% 50% 2045%  
 Terms, 60 days; 2% cash 10 days. Fac-  
 tory shipments generally delivered.  
 See also Eave Troughs.

**Coolers, Water—**

Gal., each, 2 3 4 6 8  
 Labrador... \$1.20 \$1.50 \$1.80 \$2.10 \$2.70  
 Gal... \$1.20 \$1.50 \$1.80 \$2.10 \$2.70  
 Iceland, ea. \$1.80 \$2.10 \$2.40 \$2.70 \$3.00  
 Galvanized... \$1.85 \$2.00 \$2.25 \$2.50 \$3.00  
 Galvanized, Lined, side handles,  
 Gal... \$1.95 \$2.15 \$2.40 \$2.70 \$3.15  
 White Enamelled, 25%; Agate Lined, 25%

**Coopers' Tools—**

See Tools, Coopers'.

**Coppers' Soldering—**

Soldering Coppers, 3 lbs. to pair  
 and heavier, 32¢; lighter  
 than 3 lb. to pair... 34¢

**Cord— Sash—**

Braded, Drab... 10.35¢  
 Braded, White, Com., Nos. 8  
 to 12, 26¢; No. 7, 26¢; No. 6,  
 27¢.

**Cable Laid Italian, lb., No. 18, 37¢**

Italian, lb., A, No. 18, 25¢; B, 22¢  
 Common India... lb., 11¢  
 Cotton Sash Cord, Twisted, 18¢  
 Patent Russia... lb., 20¢  
 Cable Laid Russia... lb., 21¢  
 India Hemp, Br'd'd... lb., 21¢  
 India Hemp, Twisted... lb., 13¢  
 Patent India, Twisted... lb., 17¢

**Anniston Cordage Co.: 3 lb. solid**

Braded, Nos. 8 to 12, 30¢; No. 7,  
 30¢; No. 6, 30¢; No. 5, 30¢.  
 Oriole, 20¢; 30¢; 50¢; 60¢.  
 30¢; Victoria, 10¢; 50¢; 6-Thread,  
 10¢; 60¢; 3-Thread, 10¢; 50¢; 50¢.  
 Manila, 10¢; 60¢; Jute, 10¢.  
 Pearl Braded, cotton No. 6, 4¢  
 25¢; No. 7, 25¢; No. 8 to 12, 26¢  
 Edystone, Braded, Nos. 8 to 12,  
 26¢; 17, 26¢; 6, 27¢.  
 Harmon Cable Laid Italian, Nos. 7  
 to 10... lb., 23¢

**Wire Sash Cord...**

Wire Sash Cord... 10%  
 Sash Cord Attachments, per doz. 10¢  
 Samson, Nos. 8 to 12:  
 Braded, 3 lb., Drab Cotton,  
 Italian Hemp, 40¢  
 50¢; Lined, 65¢; White Cot-  
 ton, 50¢; Spot Cord... 50¢  
 Massachusetts, White... lb., 40¢  
 Massachusetts, Drab... lb., 45¢  
 Phoenix, White, Nos. 8 to 12, 27¢  
 Silver Lake, per lb.:  
 B, Drab, 40¢; B, White, 35¢;  
 Italian Hemp, 40¢; Lined... 37¢  
 See also Chain and Ribbon.

**Wire, Picture—**

List July 10, 1906... 65410410%  
 Hendryx Standard Wire Picture Cord,  
 old list, 85410%  
 Turner & Stanton Co. Wire Picture  
 Cord... 90%

**Cradles—**

Grain... 4041542%

**Crayons—**

White Round Crayons, Cases, 100  
 gro., 45¢; at factory, but  
 lower prices made by jobbers  
 Zelnicke's Lumber... 40¢  
 White and Purple, Indelible... 75¢  
 Blue, Red, Green, Yellow and  
 Terra Cotta, 50¢; Black... 40¢  
 Giant Lumber, 5/4 in. x 15-16 in.  
 round, all colors, 16.25; Indel-  
 ible... 18.75  
 Genuine Soapstone, Metal Workers',  
 5 in. x 1/4 in. Round, 12.50; 5 in. x  
 3/4 in. Square, 11.75; 5 x 1/4 x 3-16,  
 12.50; 5 x 1/4 x 3-16... 13.00

**Crooks, Shepherds—**

Fort Madison, per doz., Heavy, 47.00;  
 Light... 40.50

**Crow Bars—See Bars, Crow.****Cultivators—**

Victor Garden... 50%

**Cutlery, Table—**

International Silver Company:  
 No. 12 M'd'm Silver, 1847, 9 doz. \$3.50  
 Star, Eagle, Rogers & Hamilton  
 and Anchor... 9 doz. \$3.00  
 Wm. Rogers & Son... 9 doz. \$2.50

**Cutters— Glass—**

H. H. Mayhew Co... 40%  
 Red Devil... 50%  
 Smith & Hemmway Co... 40%  
 Woodward... 40%

**Meat and Food—**

American... 30%  
 No. 1... 401 402 403 404 405 406 407  
 Each \$5 \$7 \$10 \$12 \$25 \$50 \$50  
 Enterprise:  
 No. 5 10 12 22 32  
 Each \$2 \$3 \$2.75 \$1.50 \$6 25 50 74 50  
 No. 302, \$1.00... 40474%  
 Dixon's... 40¢  
 No. 1... 14.00 17.00 19.00 23.00  
 Ideal... 404045%  
 Little Giant... 40 doz. 40450%  
 No. 305 310 312 320 322  
 \$35.00 \$48.00 \$44.00 \$72.00 \$68.00  
 N. E. Food Choppers... 25%  
 New Triumph No. 605, 9 doz. \$24.00  
 Russell Food, No. 1, \$24.00; No. 2,  
 \$27.00... 45410410%  
 Woodruff's... 40 doz. 3043045%  
 No. 1... 100 150  
 Enterprise Beef Shavers... 25430%

**Slaw and Kraut—**

Henry Disston & Sons:  
 Slaw and Kraut Cutters... 35%  
 Corn Graters... 30%  
 J. M. Mast Mfg. Co.:  
 Slaw Cutters, 1 Knife... 40¢  
 Combined Slaw Cutter and Corn  
 Grater... 40¢  
 Tucker & Dorsey Mfg. Co.:  
 Kraut Cutters... 40%  
 Slaw Cutters, 1 Knife... 40¢  
 Slaw Cutters, 2 Knife... 40¢

**Tobacco—**

All Iron, Cheap... doz. \$4.2544.50  
 Enterprise... 25430%  
 National, 9 doz., No. 1, \$21; No. 2,  
 \$18... 40%

**Diggers, Post Hole, &c.—**

Disston's:  
 Rapid, 9 doz., \$24.00... 25%  
 Samson, 9 doz., \$34.00... 25%  
 Iwan's Imp'ed Post Hole Auger... 4045%  
 Vaughan Pattern Post Hole Augers,  
 9 doz., \$6.25  
 Perfection Post Hole Diggers,  
 9 doz., \$8.75  
 Split Handle Post Hole Diggers,  
 9 doz., \$7.75  
 Kohler's, 9 doz., Universal, \$14.00;  
 Little Giant, \$12.00; Hercules,  
 \$10.00; Invincible, \$9.00; Rival,  
 \$8.00; Pioneer, \$7.00;  
 Never-Break Post Hole Diggers, 9  
 doz., \$24.00... 40%

**Dividers—See Compasses.****Drawers, Money—**

Tucker's Pat. Alarm Till No. 1, 9  
 doz., \$18; No. 2, \$15; No. 3, \$12;  
 No. 4, \$10.

**Drawing Knives—**

See Knives, Drawing.

**Dressers, Emery Wheel—**

Sterling Emery Wheel Dressers... 35%  
 Sterling Wheel Dresser Cutters... 35%

**Drills and Drill Stocks—**

Blacksmiths' Common Drilling  
 Machines... 1.5041.75

Breast, Millers Falls... 10410%  
 Breast, I. S. & W... 4040%  
 Goodell Automatic Drills... 5041040%  
 Johnson's Automatic Drills, Nos. 2  
 and 3... 164%  
 Johnson's Drill Points... 164%  
 Millers Falls Automatic Drills... 30410%  
 Ratchet, Curtis & Curtis... 25%  
 Ratchet, Parker's... 40%  
 Ratchet, Weston's... 40%  
 Ratchet, Weston's, Style H im-  
 proved... 40%  
 Ratchet, No. 012... 40%  
 Ratchet, Celebrated... 40%  
 Ratchet, Whitney's, P., S. & W... 50%  
 Whitney's Hand Drill, No. 1, \$10.00;  
 Adjustable, No. 1, \$12.00... 334%

**Twist Drills—**

Bit Stock... 6041041070%  
 Taper and Straight Shank... 6041041045%

**Drivers, Screw—**

Screw Driver Bits, per doz. 45¢  
 Halsey's Screw Holder and Driver,  
 9 doz., 2 1/2-in., 36; 4-in., 47.50; 6-in.,  
 50%  
 Buck Bros. Screw Driver Bits... 50%  
 Champion... 50%  
 Disston's... 70%  
 Edson... 60%  
 Fray's Hol. H'dle Sets, No. 3, \$12.50  
 Ford's Brace Screw Drivers... 40410%  
 Gay's Double Action Ratchet... 35%  
 Goodell's Auto... 40410%  
 Mayhew's Black Hand... 40410%  
 Mayhew's Monarch... 40%  
 Millers Falls, Nos. 20 and 21... 25410%  
 Millers Falls, Nos. 11, 12, 41, 42, 15410%  
 New England Specialty Co... 30%  
 Smith & Hemenway Co., Never-  
 turn, 4045%  
 H. D. Smith Co.'s Perfect H'dle... 50%  
 Stanley R. & L. Co.'s:  
 No. 64, Varn. Handles, 40410%; No.  
 65, 70%; DeLancey, 75%; Hurwood  
 50%  
 Swan's  
 Nos. 7565 to 7568, 50%; No. 7540,  
 40410%

**Eave Trough, Galvanized—**

Territory, L. C. L. Galvanized  
 Galv. Charcoal Copper.  
 Steel Iron. 14, 16, 20 oz.

**Eastern:**

70430% 70% 30%  
 Central:  
 75410424% 65410% 20410%  
 Western and Southern:  
 75474% 65% 20474%  
 So. Western:  
 75% 60410% 2045%  
 Terms—2% for cash. Factory ship-  
 ments generally delivered.  
 See also Conductor



**Extractors, Lemon Juice**

—See Squeezers, Lemon.  
**Fasteners, Blind—**

Zimmerman's ..... 50¢10¢  
Wallings ..... 60¢10¢

**Cord and Weight—**

Ives ..... 35¢4

**Faucets—**

Cork Lined ..... 50¢50¢10¢  
Metallic Key, Leather Lined ..... 60¢10¢70¢

Red Cedar ..... 40¢10¢50¢  
Petroleum ..... 70¢10¢75¢

L. & L. Co. .... 60¢10¢  
Star ..... 50¢10¢

West Lock ..... 50¢10¢  
John Sommer's Peerless Tin Key ..... 40¢

John Sommer's Boss Tin Key ..... 40¢  
John Sommer's Victor Mtl. Key ..... 50¢10¢

John Sommer's Duplex Metal Key ..... 40¢  
John Sommer's Diamond Lock ..... 40¢

John Sommer's I. X. L. Cork Lined ..... 50¢  
John Sommer's Reliable Cork Lined ..... 50¢10¢

John Sommer's Chicago Cork Lined ..... 60¢10¢  
John Sommer's O. K. Cork Lined ..... 50¢

John Sommer's No Brand Cedar ..... 50¢  
John Sommer's Perfection, Cedar ..... 40¢

McKenna, Brass ..... 50¢10¢  
Burglar Proof, N. P. .... 25¢

Improved, 1/2 and 1/4 inch ..... 25¢  
Self Measuring ..... 40¢10¢

Enterprise, 2 doz. \$36.00 ..... 40¢10¢  
Lane's, 3 doz. \$36.00 ..... 40¢10¢

National Measuring, 3 doz. \$36.00 ..... 40¢10¢

**Felice Plates—**

See Plates, Felice.

**Files— Domestic—**

List Nov. 1, 1899.

Best Brands ..... 70¢10¢75¢10¢  
Standard Brands ..... 75¢10¢75¢10¢10¢

Lower Grade ..... 75¢10¢10¢80¢10¢

**Imported—**

Stubs' Tapers, Stubs' List, July 21, '97 ..... 35 1-3@40¢

**Fixtures, Fire Door—**

Richards Mfg. Co.:  
Universal, No. 100; Special, No. 104 ..... \$3.75

Fusible Links, No. 96 ..... 50¢  
Expansion Bolts, No. 107 ..... 60¢10¢

**Grindstone—**

Net Prices:  
Inch ..... 15 17 19 21

Per doz. .... \$3.25 3.75 4.25 4.75

P. S. & W. Co. .... 30¢10¢  
Reading Hardware Co. .... 60¢

Stowell's Giant Grindstone Hanger ..... 40¢  
Stowell's Grindstone Fixtures, Extra Heavy, 40¢10¢; Light ..... 50¢

**Fodder Squeezers—**

See Compressors.

**Forks—**

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Easy Potato ..... 60¢10¢  
Victor, Hay ..... 60¢15¢25¢

Victor, Manure ..... 60¢  
Victor, Header ..... 60¢

Champion, Hay ..... 60¢  
Champion, Header ..... 60¢

Champion, Manure ..... 60¢15¢25¢  
Columbia, Hay ..... 60¢25¢

Columbia, Manure ..... 60¢  
Columbia, Spading ..... 70¢12¢

Hawkeye Wood Barley ..... 40¢10¢  
W. & C. Potato Digger ..... 60¢10¢

Acme Hay ..... 60¢20¢  
Acme Manure, 4 tine ..... 60¢10¢25¢

Dakota Header ..... 60¢20¢  
Jackson Steel Barley ..... 60¢20¢

Kansas Header ..... 60¢  
W. & C. Favorite Wood Barley ..... 40¢

Plated.—See Spoons.

**Frames— Saw—**

White, 8'x7' Bar, per doz. 75¢80¢  
Red, 8'x7' Bar, per doz. \$1.00@1.25

Red, Dbl. Brace, per doz. \$1.40@1.59

**Freezers, Ice Cream—**

Qt. .... 1 2 3 4 6

Each ..... \$1.50 \$1.60 \$1.90 \$2.20 \$2.50

**Fruit and Jelly Presses—**

See Presses, Fruit and Jelly.

**Fry Pans—See Pans, Fry.****Fuse— Per 1000 Feet.**

Hemp ..... \$2.75

Cotton ..... 3.20

Waterproof Sgl. Taped. 3.65

Waterproof Dbl. Taped. 4.40

Waterproof Tpl. Taped. 5.15

**Gates, Molasses and Oil—**

Stebbins' Pattern ..... 30¢10¢

**Gauges—**

Marking, Mortise, &c. 50¢50¢10¢

Chapin-Stephens Co.:  
Marking, Mortise, &c. .... 50¢50¢10¢

Dimston's Marking, Mortise, &c. .... 60¢  
Stanley R. & L. Co.'s Butt and Rabbet Gauge ..... 25¢

Marking and Mortise ..... 25¢  
Wire, Brown & Sharpe's ..... 35¢

Wire, Morse's ..... 25¢  
Wire, P. S. & W. Co. .... 30¢

**Gimlets— Single Cut—**

Numbered assortments, per gro.

Nail, Metal, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 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1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 154





**Potato—**  
Baratona..... doz. \$7.00  
White Mountain..... doz. \$6.00

**Picks and Mattocks—**  
List, Feb. 23, 1899..... 70¢/10¢/75¢  
Cronk's Handled Garden Mattock,  
doz. No. 2, \$2.60; No. 3, \$3.40.

**Pinking Irons—**  
See Irons, Pinking.

**Pins, Escutcheon—**  
Brass..... 50¢/10¢/60¢  
Iron, list Nov. 11, '85..... 60¢/60¢/10¢

**Pipe, Cast Iron Soil—**  
Carload lots.

Standard, 2-6 in. 50¢/10¢/5¢  
Extra Heavy, 2-6 in. 65¢/10¢  
Fittings..... 70¢/10¢/70¢/10¢/5¢

**Pipe, Merchant—**  
Consumers, Carloads.

	Steel.	Iron.	Blk. Galv.	Blk. Galv.
1/2 & 3/4 in.	67	51	61.5	48.5
1 in.	69	55	64.5	56.5
1 1/2 in.	71	59	72.5	62.5
2 in.	75	65	72.5	62.5
2 1/2 in.	70	55	63	53

**Pipe, Vitrified Sewer—**  
Carload lots.

Standard Pipe and Fittings, 3  
to 24 in., f.o.b. factory.

First-class..... 85¢/86¢  
Second-class..... 90¢

NOTE—Market irregular.

**Pipe, Stove—**

	Per 100 joints.	C. L.	L. C.
Edwards' Nested:			
5 in. Standard Blue.....	4.25	7.75	
6 in. Standard Blue.....	4.75	7.75	
7 in. Standard Blue.....	7.75	8.75	
8 in. Royal Blue.....	7.00	8.00	
9 in. Royal Blue.....	7.50	8.50	
10 in. Royal Blue.....	8.50	9.50	

**Planes and Plane Irons—**  
Wood Planes—

Bench, first qual..... 30¢/50¢/10¢  
Bench, second qual..... 40¢/40¢/10¢  
Molding..... 25¢/25¢/10¢  
Bailey's (Stanley R. & L. Co.)..... 35¢/25¢/10¢  
Chapin-Stephens Co.:  
Bench, First Quality..... 30¢  
Bench, Second Quality..... 40¢  
Molding and Miscellaneous..... 25¢  
Toy and German..... 30¢  
Union..... 60¢

**Iron Planes—**  
Bailey's (Stanley R. & L. Co.)..... 35¢  
Chapin's Iron Planes..... 50¢/10¢  
Miscellaneous Planes (Stanley R. & L. Co.)..... 30¢/5¢  
Union..... 60¢

**Plane Irons—**  
Wood Bench Plane Irons, list

Dec. 12, '06..... 25¢  
Buck Bros..... 30¢  
Chapin-Stephens Co..... 25¢  
Stanley R. & L. Co..... 35¢  
Union..... 25¢  
L. & J. White..... 25¢/25¢

**Planters, Corn, Hand—**  
Kohler's Eclipse..... doz. \$4.00

**Plates—**  
Felloe..... lb. 4¢/4¢  
Self-Sealing Pie Plates (R. M. Co.)..... doz. \$2.00..... 50¢

**Pliers and Nippers—**  
Button Pliers..... 75¢/10¢/75¢, 10, 5¢  
Gas Burner, per doz., 5 in., \$1.25  
@ \$1.30; 6 in., \$1.45 @ \$1.50.  
Gas Pipe..... 7 8 10 12-14  
\$2.00 \$2.25 \$2.75 \$3.50

Acme Nippers..... 50¢/5¢  
Cronk & Carrier Mfg. Co.:  
American Button..... 80¢  
Improved Button..... 75¢/10¢  
Cronk's..... 50¢  
No. 50 Lineman's..... 50¢  
Stub's Pattern..... 45¢  
Combination and others..... 33¢  
Heller's Farriers' Nippers, Pincers  
and Tools..... 40¢/50¢/10¢/5¢  
The Nettleton Mfg. Co. Reversible  
Cutting Nippers..... 40¢  
P. S. & W. Timmers' Cutting Nip-  
pers..... 50¢  
Wm. Schollhorn Co.:  
Bernard, 33 1/2%; Elm City, 33 1/2%;  
Paragon, 50%; Lodi, 50%.

Swedish Saw, End and Disagonal Cut-  
ting Pliers..... 50¢  
Utica Drop Forge & Tool Co.:  
Pliers and Nippers, all kinds..... 60¢

**Plumbs and Levels—**  
Chapin-Stephens Co.:  
Plumbs and Levels..... 30¢/30¢/10¢  
Chapin's Imp. Brass Cor..... 40¢/40¢/10¢  
Pocket Levels..... 30¢/30¢/10¢  
Extension Sights..... 30¢/30¢/10¢  
Machinists' Levels..... 40¢/40¢/10¢  
Diston's Plumbs and Levels..... 60¢/10¢  
Diston's Pocket Levels..... 60¢/10¢  
C. E. Jennings & Co.'s Iron..... 33 1/2%  
C. E. Jennings & Co.'s Iron, Adjust-  
able..... 40 1/2%  
Stanley R. & L. Co..... 40¢  
Stanley's Duplex..... 40¢  
Woods' Extension..... 33 1/2%

**Poachers, Egg—**  
Buffalo Steam Egg Poachera, No. 3,  
1, \$6.00; No. 2, \$5.00; No. 1,  
\$3.00; No. 4, \$12.00..... 50¢

**Points, Glaziers—**  
Bulk and 1-lb. papers..... lb. 10¢  
1/4-lb. papers..... lb. 9¢/10¢  
1/2-lb. papers..... lb. 9¢/10¢

**Pokes, Animal—**  
Pt. Madison Hawkeye..... doz. \$2.25  
Pt. Madison Western..... doz. \$4.00

**Police Goods—**  
Manufacturers' Lists..... 33¢/33¢/5¢  
Tower's..... 50¢

**Polish—Metal, Etc—**  
Glasbrite, No. 2, 5 lb can (powder),  
each, \$1.25; doz. \$12.00; No. 2, 10 lb  
can (cake), each, \$2.50; doz. \$25.00.  
Prestoline Liquid, No. 1 (1/4 pt.),  
each, \$3.00; No. 2 (1/4 qu.), \$3.00, 40¢  
Prestoline Paste..... 40¢  
George William Hoffman:  
U. S. Metal Polish Paste, 3 oz.  
boxes, doz. \$6.00; doz. \$4.50.  
1/2 lb boxes, doz. \$1.25; 1 lb  
boxes, doz. \$2.25.  
U. S. Liquid, 8 oz. cans, doz.,  
\$1.25.  
Barkeepers' Friend Metal Polish, 1/2  
doz., \$1.75.

**Stove—**  
Black Eagle Benzine Paste, 5 lb cans,  
doz. \$1.00  
Black Eagle, Liquid, 1/2 pt. cans,  
doz. \$1.00  
Black Jack Paste, 1/2 lb cans, doz. \$1.00  
Black Kid Paste, 5 lb cans, each, \$0.65  
Ladd's Black Beauty Liquid, per  
100 tins..... \$6.75  
Joseph Dixon's, gr. \$6.75..... 10¢  
Dixon's Plumbago..... 10¢  
Freside..... gr. \$2.50  
Gem, gr. \$4.50..... 10¢  
Japanese..... gr. \$3.50  
Jet Black..... gr. \$3.50  
Peerless Iron Enamel, 10 oz. cans,  
doz. \$1.50

Wynn's Black Silk:  
Paste, cans, doz. 5 oz., \$0.75;  
1/2 lb, \$1.00; 1 lb, \$1.75  
Paste, 5 lb cans, doz. \$0.70  
Liquid, cans, doz. 6 oz., \$0.75;  
1/2 pt., \$1.00; 1 pt., \$1.75  
Steel Range Enamel, 1/2 doz., 1/4 pt.,  
\$1.00; 1/2 pt., \$1.25.

**Poppers, Corn—**  
1 qt. Square, doz. \$0.80; gro. \$8.00  
1 qt. Round, doz. \$0.90; gro. \$9.00  
1/2 qt. Square, doz. \$1.00; gro. \$10.00  
2 qt. Square, doz. \$1.20; gro. \$12.00

**Post Hole and Tree Au-  
gers and Diggers—**  
See also Diggers, Post Hole, &c.

**Posts, Steel—**  
Steel Fence Posts, each, 5 ft., 42¢;  
6 ft., 44¢; 6 1/2 ft., 46¢  
Steel Hitching Posts..... each \$1.30

**Potato Parers—**  
See Parers, Potato.

**Pots, Glue—**  
Enameled..... 35¢/10¢  
Tinned..... 30¢/10¢

**Powder—**  
In Canisters:  
Duck, 1 lb..... each 45¢  
Fine Sporting, 1 lb..... each 75¢  
Rifle, 1/2 lb..... each 15¢  
Rifle, 1 lb..... each 25¢

**In Kegs:**  
12 1/2 lb. kegs..... \$3.50  
25 lb. kegs..... \$4.50  
King's Smokeless:  
Keg (25 lb bulk)..... \$5.50  
Half Keg (12 1/2 lb bulk)..... \$3.50  
Quarter Keg (6 1/2 lb bulk)..... \$1.90  
Case 24 (1 lb cans bulk)..... \$4.50  
King's Smokeless Shot Gun Rifle,  
Keg (25 lb bulk)..... \$12.00 \$15.00  
Half Keg (12 1/2 lb bulk)..... 2.25 7.75  
Quarter Keg (6 1/2 lb bulk)..... 3.25 4.00  
Case 24 (1 lb cans bulk)..... 14.00 17.00  
Half case 12 (1 lb c. bk.)..... 7.25 8.75  
Robin Hood Sm'less Shot Gun..... 50¢/20¢

**Presses—**  
Fruit and Jelly—  
Enterprise Mfg. Co..... 20¢/25¢

**Seal Presses—**  
Morrill's No. 1, 1/2 doz., \$20.00..... 50¢

**Pruning Hooks and Shears**  
See Shears.

**Pullers, Nail—**  
Cyclops..... 50¢  
Miller's Falls, No. 3, 1/2 doz., \$12.00..... 33 1/2%  
Morrill's No. 1, Nail Puller, 1/2 doz.,  
\$20.00..... 50¢  
Pearson No. 1, Cyclone Spike Puller,  
each \$30.00..... 50¢  
Scranton, Case Lots..... 50¢  
No. 2B (large)..... \$5.50  
No. 3B (small)..... \$5.00  
Smith & Hemenway Co.:  
Diamond B. case lots, 1/2 doz., Large,  
\$5.00; Small, \$7.50.  
Glant No. 1, 1/2 doz., \$18; No. 1 1/2,  
\$16.50; No. 3, \$15..... 33 1/2%  
Staple Pullers, Utica and Davi-  
son..... 60¢  
Parrot Tack and Stub Puller, 1/2 doz.,  
75¢; 1/2 doz., \$4.00

**Pulleys, Single Wheel—**  
Inch..... 1 1/4 1 1/2 2 3  
Acting or Tackle..... 1 1/4 1 1/2 2 3  
doz. \$0.50 \$1.00 \$1.50 1.05  
Hay Fork, Swivel or Solid Eye,  
doz. 4 in., \$1.25; 5 in., \$1.55  
Inch..... 1 1/4 1 1/2 2 3  
Hot House, doz. \$0.65 \$1.00 1.50  
Inch..... 1 1/4 1 1/2 2 3  
Screw, doz. \$0.15 \$0.25 \$0.30  
Inch..... 1 1/4 1 1/2 2 3  
Side, doz. \$0.25 \$0.40 \$0.50  
Inch..... 1 1/4 1 1/2 2 3  
Stowell's:  
Ceiling or End, Anti-Friction..... 60¢/10¢  
Dumb Waiter, Anti-Friction..... 60¢/10¢  
Electric Light..... 60¢  
Side, Anti-Friction..... 60¢/10¢

**Sash Pulleys—**  
Common Frame; Square or  
Round End, per doz. 1 1/4 and  
2 in..... 10¢/10¢  
Auger Mortise, no Face Plate,  
per doz., 1 1/4 and 2 in..... 10¢/10¢  
Acme..... 1 1/4 in., 16¢; 2 in., 19¢  
Fox-All-Steel, Nos. 3 and 1, 2 in.....  
doz. 50¢

Grand Rapids All Steel Noiseless..... 50¢  
Ideal..... 70¢/5¢  
Niagara..... 1 1/4 in., 16¢; 2 in., 19¢  
No. 28, Troy, 1 1/4 in., 14¢; 2 in., 16¢  
Star..... 1 1/4 in., 16¢; 2 in., 19¢  
Tackle Blocks—See Blocks.

**Pumps—**  
Clater's..... 60¢  
Pitcher Spout..... 75¢/5¢/10¢  
Wood Pumps, Tubing, &c. 45¢/50¢  
Barnes Dbl. Acting (low list)..... 40¢/10¢  
Barnes Pitcher Spout..... 75¢/10¢  
Contractors' Rubber Diaphragm No.  
2, B. & L. Block Co..... \$16.00  
Daisy Spray Pump..... doz. \$6.50  
Flint & Walling's, Fast Mail Hand,  
(low list)..... 50¢  
Flint & Walling's Fast Mail (low  
list)..... 55¢  
Flint & Walling's Tight Top Pitcher.....  
75¢/10¢/5¢  
National Specialty Mfg. Co., Measur-  
ing, Nos. 2, \$6.50; 3, \$6.50..... 30¢  
Myers' Pumps (low list)..... 40¢/10¢  
Myers' Power Pumps..... 40¢/10¢  
Myers' Spray Pumps..... 40¢/10¢

**Pump Leathers—**  
Plunger and Lower Valve—Per  
gro.:  
Inch... 2 2 1/2 2 3/4 3 3 1/2 3 3/4  
Inch... 3 3 1/4 3 1/2 3 3/4 3 3/4 3 3/4  
\$3.30 3.60 3.85 4.10 4.40  
Plunger Cup Leathers—Per 100:  
Inch... 2 2 1/2 2 3/4 3 3 1/2 3 3/4  
\$3.75 3.85 5.00 6.00

**Punches—**  
Saddlers' or Drive, good.....  
doz. 50¢/75¢  
Spring, single tube, good qual-  
ity..... \$1.75/\$2.00  
Revolving (4 tubes)..... \$3.50/\$3.75

Bemis & Call Co.'s Cast St'l Drive..... 50¢  
Morrill's Nos. 1AA, 1A, 1B, 1C,  
1D, 1E..... 50¢  
Hercules, 1 die, each \$5.00..... 50¢  
Niagara Hollow Punches..... 40¢  
Niagara Solid Punches..... 55¢/10¢  
Wm. Schollhorn Co.:  
Bolt and Ticker, Bernard, 33 1/2%;  
Paragon, 50%; Lodi..... 50¢  
Timmers' Hollow, P. S. & W. Co. 33 1/2%  
Timmers' Solid, P. S. & W. Co., 1/2  
doz., \$1.44..... 50¢

**Rail—Barn Door, &c.—**  
Sliding Door, Painted Iron.....  
2 1/4 2 1/2 2 3/4 3 3 1/2 3 3/4 3 3/4

Sliding Door, Wrought Brass,  
1 1/4 in., lb., 36¢  
Aitch Mfg. Co.: Reliable Hanger  
Track..... 50¢  
Cronk's:  
Double Braced Steel Rail, 1/2 ft. 3 1/4¢  
O. N. T. Rail..... 3¢  
Hinge Rail..... 39¢  
Griffin's:  
xxx, 100 ft., 1 x 3-16 in., \$3.00;  
1 x 3-16 in., \$3.50;  
Hinged Hanger, 100 ft., 1 x 3-16  
in., \$3.10; 1 1/4 x 3-16 in., \$3.80.  
Lane's:  
Hinged Track, 100 ft., 1 in., \$3.00;  
1 1/4 in., \$3.50.  
O. N., 100 ft., 1 in., \$3.00; 1 1/4  
in., \$3.50; 1 1/2 in., \$4.00.  
Standard, 1 1/2 in., 100 ft. \$4.00  
Lawrence Bros.:  
100 ft., No. 201, \$4.00; No. 202, \$4.00  
New York, 1 x 3-16 in., 100 ft. \$3.00  
McKinney's:  
Hinge Hanger Rail, 1/2 ft., 11¢..... 50¢  
None Better..... 1/2 ft. 3 1/4¢  
Standard..... 1/2 ft. 3 1/4¢  
Myers' Stayon Track..... 60¢/10¢  
Richards' Mfg. Co.:  
Common, 1 x 3-16 in., \$3.00; 1 1/4 x  
3-16, \$3.25; 1 1/2 x 3-16, \$3.50.  
Special Hinged Hanger Rail..... 60¢/10¢  
Lag Screw Rail, No. 55..... 50¢  
Gauge Trolley Track, 1/2 ft., No. 31,  
9¢; No. 32, 14¢; No. 33, 20¢  
No. 50, 60¢/10¢  
Nos. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64,  
\$4.00; 65, \$3.25; 66, \$3.50; 67, No. 1,  
\$3.25; 68, No. 2, \$3.50.  
Stowell's:  
Cast Rail..... 1/2 ft. 2 1/4¢  
Steel Rail, Plain..... 1/2 ft. 2 1/4¢  
Wrought Bracket, 1 3-16 in. 1/2 ft. 3¢  
Wrought Bracket, 1 1/2 x 5-16 in. 1/2 ft. 7¢  
Swett's Hylco, 1/2 ft. 11¢..... 60¢  
F. L. B. Steel Rail..... 100 ft. \$3.00  
No. 6, 1 x 3-16..... 100 ft. \$3.00

**Rakes—**  
NOTE—Many goods are sold  
at net prices.  
Fort Madison Red Head Lawn..... \$2.25  
Fort Madison Blue Head Lawn..... \$2.70  
Jackson Lawn, 20 and 30 teeth,  
doz., net..... \$4.25  
Cronk's:  
New Champion Garden, 1/2 doz. 12  
teeth, \$15.00; 14, \$16.50; 16, \$18.00. 75¢  
Victor Garden, 1/2 doz. 12 teeth,  
\$15.00; 14, \$16.50; 16, \$18.00..... 80¢  
Queen City Lawn, 1/2 doz. 20 teeth,  
\$2.50; 21, \$3.00..... net  
Anticlog Lawn, 1/2 doz. \$1.00  
Malleable Garden, 1/2 doz. \$2.75  
Ideal Steel Garden, 1/2 doz. 12 teeth,  
\$15.00; 14, \$16.00; 16, \$18.00..... 80¢  
Kohler's:  
Lawn Queen, 20-teeth..... 1/2 doz. \$2.90  
Lawn Queen, 24-teeth..... 1/2 doz. \$3.00  
Paragon, 20-teeth..... 1/2 doz. \$2.70  
Paragon, 24-teeth..... 1/2 doz. \$2.75  
Steel Garden, 14-teeth..... 1/2 doz. \$2.40  
Malleable Garden, 14-teeth, 1/2 doz.,  
\$1.75/\$2.00

**Rasps, Horse—**  
Dinton's..... 75¢  
Heller Bros..... 70¢/50¢/70¢/10¢/5¢  
Liveright Bros. Gold Medal..... 70¢/10¢/75¢  
New Nicholson..... 70¢/10¢/75¢  
See also Files.

**Razors—**  
Liana Baras-ile..... 60¢  
Fox Razors, 1/2 doz., No. 42, \$20.00; }  
No. 41, \$20.00; No. 45, Platina. } 50¢  
\$25.00  
Red Devil..... 60¢

Silberstein:  
Carbo Magnetic, \$21.00; Griffon, No.  
65, \$13.50; Griffon, No. 00, \$12.00;  
all other Razors, 40¢.

**Safety Razors—**  
Kampfe Bros.:  
Star Safety, 25¢; Star Interchange-  
able, 25¢; Star Safety Corn, 25¢  
Silberstein..... 40¢

**Reels, Fishing—**  
Hendryx:  
M 6, Q 4, A 6, B 4, M 9 1/4, M 16,  
Q 16, A 16, B 16, 4008, Rubber,  
Popolo, Nickel Popolo..... 20¢  
Aluminum, German Sil., Bronze..... 25¢  
1240 N, 124 N..... 20¢  
3004 N, 06 N, 6 RM, G 9..... 25¢  
4 N, 6 PN, 24 N, 25 PN..... 20¢  
2004 P, 33 1/2%; 2004 PN, 33 1/2%; 0924 N,  
33 1/2%; 0204 N, 33 1/2%; 002904 PN,  
33 1/2%; 802 N, 33 1/2%;  
986 PN, 2904 N, 974 PN..... 25¢  
5009 PN, 5009 N..... 20¢  
Competitor, 102 P, 102 PN, 202 P,  
202 PN, 102 PR, 202 PR..... 20¢  
304 P, 304 PN, 0304 P, 0304 PN, 33 1/2%

**Registers—List July 1, 1903.**  
Japanned, Electroplated and  
Bronzed..... 66¢/66¢/10¢  
White Porcelain Enamel..... 60¢  
Solid Brass or Bronze Metal.....  
40¢/10¢

**Revolvers—**  
Single Action..... 95¢/\$1.00  
Double Action, except 44 cal. \$1.85  
Double Action, 44 caliber..... \$2.00  
Automatic..... \$3.25  
Hammerless..... \$3.75

**Riddles, Hardware Grade**  
16 in..... per doz. \$2.50/\$2.75  
17 in..... per doz. \$2.75/\$3.00  
18 in..... per doz. \$3.00/\$3.25

**Rings and Ringers—**  
Bull Rings—  
Steel..... \$0.70 0.75 0.80 doz.  
Copper..... \$1.00 1.15 1.40 doz.  
Rea's Improved Self-Piercing, 1/2 doz.,  
Copper, 2 in., \$1.25; 2 1/2 in., \$1.50;  
3 in., \$1.75.

**Hog Rings and Ringers—**  
Hill's Rings, gro. boxes \$1.00/\$1.50  
Hill's Ringers, Gray Iron.....  
doz. 50¢/55¢  
Hill's Ringers, Malleable Iron.....  
doz. 70¢/75¢  
Blair's Rings..... per gro. \$1.75/\$2.25  
Blair's Ringers, per doz. \$0.60/\$0.65  
Brown's Rings..... per gro. \$5.00/\$5.50  
Brown's Ringers, per doz. \$0.60/\$0.65

**Rivets and Burrs—**  
Copper..... 35¢/33 1/2%  
Carriage, Coopers', Tanners', &c.,  
Black..... 70¢/10¢  
Metallic Tinned..... 70¢  
Bifurcated and Tubular—  
Assorted in Boxes.  
Bifurcated, per doz. boxes, paste-  
board boxes, 25¢/25¢; Tin boxes,  
25¢/25¢.  
Tubular, per doz. boxes, 50 count,  
1 1/4; 100 count, 51¢/58¢.

**Rollers—**  
Acme, Stowell's Anti-Friction..... 50¢  
Cronk's Stay No. 65, \$0.90; No.  
60..... \$1.00  
Cronk's Brinkerhoff No. 65, \$0.60;  
No. 66..... \$0.84  
Lane's Stay..... 40¢  
Richards' Stay:  
Handy Adj. and Reversible No. 63, 75¢  
O. K. Adj. and Reversible No. 58, 50¢  
Lag Screw, Nos. 55 and 57..... 50¢  
Underwriters', Nos. 59, 60..... 50¢  
Favorite, No. 64..... 60¢  
Stowell's Barn Door Stay, 1/2 doz. \$1.00  
Swett's Anti-Friction..... 50¢  
Screw and Spike Stay..... 1/2 doz. 65¢  
Hinge Adjustable Stay..... 1/2 doz. 90¢

**Rope—**  
Manila, 7-16 in. diam. and larger:  
Pure..... lb., 12 1/2¢/13¢  
Sisal, 7-16 in. diam. and larger:  
Pure..... lb., 9 1/4¢  
Sisal, 7-16 in. diam. and larger:  
No. 2 quality..... lb., 7 1/2¢/8¢  
Sisal, Hay, Hide and Bale  
Ropes, Medium and Coarse:  
Mixed..... lb., 7 1/2¢/8¢  
Pure..... lb., 9 1/4¢  
Sisal, Tarred, Medium Lath  
Yarn, Coarse and Untarred:  
Mixed..... lb., 7 1/2¢/8¢  
Pure..... lb., 9 1/4¢  
Cotton Rope:  
Best, 1/4-in. and larger..... 17¢/18¢  
Medium, 1/4-in. and larger..... 16¢/17¢  
Common, 1/4-in. and larger..... 10¢  
In coils, 1/2 advance.

**Wire Rope—**  
Jute Rope:  
Thread, No. 1, 1/4-in. & up, lb. 9¢  
Thread, No. 2, 1/4-in. & up, lb. 8 1/2¢  
Old Colony Manila Transmission  
Rope..... lb. 17 1/2¢

**Wire Rope—**  
Galvanized..... 37 1/2¢/42 1/2¢  
Plain..... 35¢/40¢

**Ropes, Hammock—**  
Covert Mfg. Co.:  
Jute, 35¢; Sisal..... 20¢

**Rules**  
Boxwood..... 60¢/60¢/10¢  
Ivory..... 55¢/10¢/55¢/10¢  
Chapin-Stephens Co.:  
Boxwood..... 60¢  
Flexiford..... 40¢  
Ivory..... 25¢/25¢/10¢  
Miscellaneous..... 55¢/10¢  
Stephens' Combination..... 55¢  
Stationers'..... 10¢

Keuffel & Esser Co.	35.10%
Folding, Wood	33.40%
Folding, Steel	33.40%
Lufkin's Steel	50.10%
Lufkin's Lumber	60%
Stanley R. & L. Co.	60%
Boxwood	60%
Ivory	60%
Miscellaneous	60%
Zig Zag	60%
Zig Zag, Pin Joint	60%
Upon Nut Co.	60%
Boxwood	60%
Ivory	60%

**Sash Balances—**

See Balance, Saw.

**Sash Locks—**

See Locks, Sash.

**Sash Weights—**

See Weights, Sash.

**Sausage Stuffers or Fillers**

See Stuffers or Fillers, Sausage.

**Saw Frames—**

See Frames, Saw.

**Saw Sets—**

See Sets, Saw.

**Saw Tools—**

See Tools, Saw.

**Saws—**

Atkins'	45%
Circular	50%
Band	50%
Butcher Saws	50%
Cross Cuts	50%
One-Man Cross Cut	50%
Narrow Cross Cut	50%
Hand, Rip and Panel	50%
Miter Box and Compass	50%
Mulay, Mill and Drag	50%
Chapin-Stephens Co.	50%
Turning Saws and Frames	50%
Diamond Saw & Stamping Works	50%
Sterling Kitchen Saws	50%
Disston's:	
Circular, Solid and Ins'ted Tooth	50%
Band, 2 to 18 in. wide	50%
Hand, 1/2 to 1 1/2	50%
Crosscuts	50%
Narrow Crosscuts	50%
Mulay, Mill and Drag	50%
Framed Woodsaws	50%
Woodsaw Blades	50%
Woodsaw Rods, Tinned	50%
Hand Saws, Nos. 12, 14, 16, 18, 20	50%
18, 20, 22, 24, 26, 28, 30, 32	50%
Hand Saws, Nos. 7, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32	50%
Combination	50%
Compass Key Hole, &c.	50%
Butcher Saws and Blades	50%
C. E. Jennings & Co.'s:	
Butcher Saws	50%
Compass and Key Hole Saws	50%
Framed Wood Saws	50%
Hand Saws	50%
Wood Saw Blades	50%
Millers Falls:	
Star Saw Blades	50%
Massachusetts Saw Works:	
Victor Kitchen Saws	50%
Butcher Saws and Blades	50%
Peace & Richardson's Hand Saws	50%
Simonds':	
Circular Saws	50%
Crescent Ground Cross Cut Saws	50%
One-Man Cross Cuts	50%
Gang Mill, Mulay and Drag Saws	50%
Band Saws	50%
Back Saws	50%
Butcher Saws	50%
Hand Saws	50%
Hand Saws, Bay State Brand	50%
Compass, Key Hole, &c.	50%
Wood Saws	50%
Wheeler, Madden & Clemens Mfg. Co.'s Cross Cut Saws	50%

**Hack Saw Blades and Frames—**

Atkins' Hack Saw Blades A A A	50%
Disston's:	
Concave Blades	50%
Keystone Blades	50%
Hack Saw Frames	50%
Simonds' File Co.	50%
C. E. Jennings & Co.'s:	
Hack Saw Frames, Nos. 175, 180	50%
Hack Saws, Nos. 175, 180, complete	50%
Goodell's Hack Saw Blades	50%
Griffin's Hack Saw Blades	50%
Star Hack Saws and Blades	50%
Sterling Hack Saw Blades	50%
Sterling Hack Saw Frames	50%
Sterling Power Hack Saws	50%
each, No. 1, \$2.00; No. 2, \$3.00; No. 3, \$4.00	50%
Victor Hack Saw Blades	50%
Victor Hack Saw Frames	50%

**Scroll—**

Barnes, No. 1, \$15	50%
Barnes' Scroll Saw Blades	50%
Barnes' Velocipede Power Scroll Saw	50%
without boring attachment, \$18	50%
with boring attachment, \$20	50%
Lester, complete, \$10.00	50%
Rogers, complete, \$3.50 and \$4.00	50%

**Scales—**

Family, Turnbull's	50%
Counter:	
Hatch, Platform, 1/4 oz. to 4 lbs.	50%
Two Platforms, 1/4 oz. to 8 lbs.	50%
Union Platform, Plain, \$1.70	50%
Union Platform, Stpd, \$1.85	50%
Chattillon's:	
Eureka	50%
Favorite	50%
Crocker's Trip Scales	50%
Chicago Scale Co.:	
The Little Detective	50%
Union or Family No. 2	50%
Portable Platform (reduced list)	50%
Wagon or Stock (reduced list)	50%
The Standard Portables	50%
The Standard R. R. and Wagon	50%

**Scrapers—**

Rox, 1 Handle	50%
Rox, 2 Handle	50%
Ship	50%

Adjustable Box Scraper (S. B. & L. Co.), \$6.00	50%
Chapin-Stephens Co., Box	50%
<b>Screws—Bench and Hand</b>	
Bench, Iron, doz., 1 in.	50%
2 1/2; 1 1/2, \$3.00; 1 1/4, \$3.50	50%
Bench, Wood	50%
Hand, Wood	50%
R. Bliss Mfg. Co., Hand	50%
Chapin-Stephens Co., Hand	50%
<b>Coach, Lag and Hand Rail—</b>	
Lag, Cone Point, list Oct. 1, '99	50%
Coach, Gimlet Point, list Oct. 1, '99	50%
Hand Rail, list Jan. 1, '01	50%

<b>Jack Screws—</b>	
Standard list	50%
Millers Falls	50%
P. S. & W.	50%
Swett Iron Works	50%

<b>Machine—</b>	
List Jan. 1, '02:	
Flat or Round Head, Iron	50%
Flat or Round Head, Brass	50%

<b>Set and Cap</b>	
Set (Iron)	50%
Set (Steel), net advance over Iron	50%
Sq. Hd. Cap	50%
Hcz. Hd. Cap	50%
Rd. Hd. Cap	50%
Fuller Hd. Cap	50%

<b>Wood—</b>	
List July 23, 1903:	
Flat Head, Iron	50%
Round Head, Iron	50%
Flat Head, Brass	50%
Round Head, Brass	50%
Flat Head, Bronze	50%
Round Head, Bronze	50%
Drive Screws	50%

**Scroll Saws—**

See Saws, Scroll.	
<b>Scythes—</b>	
Grass, No. 1, Plain	50%
Clipper, Bronzed Webb	50%
No. 3 Clipper, Pol'd Webb	50%
No. 6 Clipper and Solid Steel	50%
Bush, Weed and Bramble	50%
Grain, No. 1	50%
Bronzed Webb, No. 1	50%
Nos. 3 and 4 Clipper, Grain	50%
Solid Steel, No. 6	50%

**Seeders, Ralsin—**

Enterprise	50%
<b>Sets—Awl and Tool—</b>	
Fray's Adj. Tool Handles, Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$9; 5, \$7	50%
C. E. Jennings & Co.'s Model Tool Holders	50%
Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18	50%

**Garden Tool Sets—**

Ft. Madison Three Plows, Hoe, Rake and Shovel	50%
<b>Sets, Nail—</b>	
Octagon	50%
Huck Bros.	50%
Cannon's Diamond Point	50%
Mayhew's	50%
Snell's Cor'gated, Cup Pt.	50%
Snell's Knurled, Cup Pt.	50%
Victor Knurled Cup Pt.	50%

**Rivet—**

<b>Regular list</b>	50%
<b>Saw—</b>	
Atkins'	50%
Adjustable	50%
Disston's Star, Monarch and Triumph	50%
Morrill's No. 1	50%
Nos. 3 and 4, Cross Cut	50%
No. 5, Mill	50%
No. 10, 11, 12	50%
No. 1 Old Style	50%
Special	50%
Giant Royal Cross Cut	50%
Royal, Hand	50%
Taintor Positive	50%

**Shaving—**

Fox Shaving Sets, No. 30	50%
Smith & Hemenway Co.'s	50%
<b>Sharpeners, Knife—</b>	
Chicago Wheel & Mfg. Co.	50%
Pike Mfg. Co.:	
Fast Cut Pocket Knife Hones	50%
Mounted Kitchen Sand Stone	50%
Natural Grit Carving Knife Hones	50%
Quick Cut Emery Carving Knife Hones	50%
Quick Edge Pocket Knife Hones	50%

**Skate—**

Smith & Hemenway Co., Eureka	50%
<b>Shaves, Spoke—</b>	
Iron	50%
Wood	50%
Bailey's (Stanley R. & L. Co.)	50%
Razor Edge (Stanley R. & L. Co.)	50%
Iron, 50% Wood	50%
Chapin-Stephens Co.	50%
Goodell's	50%
Wood's F1 and F2	50%

**Shears—**

Best	50%
Good	50%
Cheap	50%
Straight Trimmers, &c.	50%
Best quality Jap.	50%
Best quality, Nickel	50%
Fair quality, Jap.	50%
Fair quality, Nickel	50%

Tailors' Shears	50%
Acme Cast Shears	50%
Heinrich's Tailors' Shears	50%
Wilkinson Shear & Cutlery Co.	50%
Sheep, 1900 list	50%
Grass	50%
Horse or Mule	50%

**Timners' Snips—**

Steel Blades	50%
Steel Laid Blades	50%
Forged Handles, Steel Blades, Berlin	50%
Heinrich's Snips	50%
Jennings & Griffin Mfg. Co.'s, 6 1/4 to 10 in.	50%
Niagara Snips	50%
F. S. & W. Forged Handles	50%

**Pruning Shears—**

Cronk's Hand Shears	50%
Cronk's Wood Handle Shears	50%
Disston's Combined Pruning Hook and Saw	50%
Disston's Pruning Hook only	50%
\$12.00	50%
John T. Henry Mfg. Co.:	
Pruning Shears, all grades	50%
P. S. & W. Co.	50%
Wilkinson Shear & Cutlery Co.:	
Hedge, Wilcut Brand	50%
Lawn and Border, Wilcut Brand	50%

**Sheaves—Sliding Door—**

Stowell's Anti-Friction	50%
Reading	50%
R. & E. list	50%
Wrightsville Hatfield Pattern	50%

**Sliding Shutter—**

Reading list	50%
R. & E. list	50%

**Shells—Shells, Empty—**

Brass Shells, Empty:	
Climax, 10 and 12 gauge	50%
Club, Rival, 65.5%; First Quality	50%

**Paper Shells, Empty:**

New Rapid, 10, 12, 16 and 20 gauge	50%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade	50%
Union, League, 12 and 14 gauge; Rival grade	50%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge; Monarch, 10, 12, 14, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade	50%
Expert, 10, 12, 16 and 20 gauge	50%

**Shells, Loaded—**

Loaded with Black Powder	50%
Loaded with Smokeless Powder, medium grade	50%
Loaded with Smokeless Powder, high grade	50%
Robin Hood:	
Smokeless Robin Hood, Low Brass	50%
Smokeless Comets, High Brass	50%
Indian, Black Powder	50%

**Shingles, Metal—Per Sq.**

Edwards Mfg. Co.:	
Painted	50%
Galv.	50%
14 x 20	50%
10 x 14	50%
7 x 10	50%

**Shingles, Metal—Per Sq.**

Wheeling Corrugating Co.:	
Tin Painted	50%
Galv.	50%
Dixie, 14 x 20 in.	50%
Dixie, 10 x 14 in.	50%
Dixie, 7 x 10 in.	50%

**Shoes, Horse, Mule, &c.—**

F.O.B. Pittsburgh:	
Iron	50%
Steel	50%
Burden's, all sizes	50%

**Shot—**

Drop, up to B.	50%
Drop, B. and larger	50%
Buck	50%
Chilled	50%
Dust	50%

**Shovels and Spades—**

Association List, Nov. 15, 1902	50%
<b>Snow Shovels—</b>	
Long Handle	50%
Wood and Mail, D. Handle	50%

**Sieves and Sifters—**

Hunter's Imitation	50%
<b>Hunter's Genuine</b>	
per gro. \$12.00 to \$15.00	50%
Buffalo Metallic Sifters, R. M. Co., per 14x16	50%
13x20	50%
13x30	50%

**Sieves, Seamless Metallic**

Mesh	50%
Iron Wire	50%
Tinned Wire	50%
Nested, 10, 11 and 12 inch	50%
Mesh 20, Nested	50%
Mesh 24, Nested	50%

**Sinks, Cast Iron—**

Painted, Standard list:	
12 x 12 to 22 x 36 in.	50%
20 x 40 to 24 x 50 in.	50%
24 x 60 to 24 x 120 in.	50%
Barnes' low list:	
Up to and including 20 x 36 in.	50%
20 x 40 to 24 x 50 in.	50%

**Skels, Wagon—**

Cast Iron	50%
Steel	50%

**Slates, School—****"D" Slates—****Eureka, Unexcelled Noiseless—****Victor A. Noiseless—****Slaw Cutters—See Cutters.****Snaps, Harness—****German****Covert Mfg. Co.:****Derby, 25%; Yankee, 50.2%; Yankee****Roller, 30.2%; High Grade, 40%; Trojan, 40%****Jockey Community:****Oneida Community:****Harness Snaps, 1 inch****Swivel Snaps****Swivels****Snaths—****Scythe****Snips, Timners—See Shears.****Spoons and Forks—****Silver Plated—****Good Quality****Cheap****International Silver Co.:****1847 Rogers Bros., 40.10%; Rogers****& Hamilton, 50.10%; Rogers****& Bro., William Rogers****Eagle Brand, 50.10%;****Anchor, Rogers Brand, 60.10%;****Wm. Rogers & Son, 60.10%****Miscellaneous—****German Silver****Cattaraugus Cutlery Co.:****Seneca Silver****Tinned Iron****Teas****Tables****Doors—****Bardley's Spring and Check****Chicago (Coll.)****Gem (Coll.)****Pullman (Coll.)****Rel**









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